

## BERRESFORD REPORTS ON BREWERY MARKET

WASHINGTON, D. C. — Advocating the immediate return of beer because of the stimulating effect it might have upon the entire electrical industry, A. W. Berresford, managing director of the National Electrical Manufacturers Association, has presented the following brief before the Ways and Means committee of the House of Representatives, which has concluded its hearings on the Collier bill.

"National Electrical Manufacturers Association includes in its membership some 275 producers of electrical material in every branch of electrical production. The combined output of its membership is from 80% to 85% of the total production of the country.

"Its interest in the enactment of the contemplated legislation lies directly in the use for its products which would result, and which is estimated in the neighborhood of \$50,000,000 during the 12 months following the enactment of a reasonable bill.

"In some degree this estimate is based upon the estimates of the brewing industry. These figures indicate that within the stated 12 months there will be provided producing capacity for 50,000,000 barrels. One-half, or 25,000,000 barrels, will be provided by new construction, and one-half by rehabilitation of existing plants.

"These estimates do not seem unreasonable in view of the fact that in 1916 the brewing industry distributed 66,000,000 barrels from a combined production capacity of 100,000,000. It will be observed that the present estimates are but one-half of the production capacity actually existing in 1916.

"An established figure for construction cost is \$8 to \$10 per barrel, so that new construction for 25,000,000 barrels would cost \$200,000,000 to \$250,000,000.

"Assuming 60% of rehabilitation to be necessary in existing plants, the equivalent cost for 25,000,000 barrels would be \$120,000,000 to \$150,000,000, making a total for new construction and rehabilitation of from \$32,000,000 to \$400,000,000.

"This estimate of 60% of new cost for rehabilitation purposes seems warranted in that little in the way of maintenance or new investment for brewing purposes has been done in the last 15 years. Much of the machinery is obsolescent or actually obsolete.

"The electrical material is definitely in this condition, and it is probable that a higher factor than 60% could reasonably be assumed for electrical material by reason of its nature and of the changes and developments in the art during the past fifteen years.

### Field for Electrical Material

"There would be three fields in which electrical product would be applicable: (a) within the brewing plant; (b) in the bulk distribution; and (c) in the retail distribution.

### Within Breweries

"A brewery employs electrical material for power generation, motor drive of machinery, and lighting. Based on equipment installed in a one and one-half million barrel plant, and allowing for the large relative cost of smaller installations, the following would appear

to be a reasonable approximation for the electrical installation per million barrels capacity:

Generating equipment, 3-2000 kw. turbo sets	\$140,000.00
Motors (1 to 350 hp.) 8,000 hp. at \$17.50 per hp.	140,000.00
Motor installation cost at \$12.00 per hp.	96,000.00
3,000 lighting outlets at \$16.00 each installed	48,000.00
<b>TOTAL</b>	<b>\$424,000.00</b>

Add 10% for switchboards, signaling systems and incidental apparatus

**TOTAL** \$466,400.00

"Based on the above, 25,000,000 barrels capacity in new construction would require \$11,650,000 of electrical material and 25,000,000 barrels capacity rehabilitated on 60% factor would cost \$6,990,000, indicating a total of electrical installation within the breweries of \$18,640,000.

### Bulk Distribution

"Most major units will have distributing centers in prominent cities to which the product will be shipped in bulk and there bottled for distribution. In 1916 one major company had 600 such distribution centers located throughout the United States.

"These centers embody electrically-driven refrigerating and bottling machinery and lighting. It is estimated that at least 1,000 will exist and that electrical installation in each will approximate \$6,000, making a total for electrical material of \$6,000,000.

### Retail Distribution

"Assuming purely bottled sale, the purchaser will demand that the bottle be sold cooled to drinking temperature for consumption on the premises and, in large measure, for consumption off the premises.

"The growing practice in distribution

of this nature is to employ the small self-contained electrical refrigeration units now available by reason of temperature control incorporated, operating cost, and general desirability.

"Three men prominent and experienced in this field have estimated that \$10,000,000 worth of such machinery will be required.

"If, however, draught sale is permitted, this figure would become at least \$30,000,000, since new methods of serving made possible by these small refrigerating units would be employed and would require the almost universal use of such equipment.

"This equipment would receive the product in bulk and would automatically maintain it always at controlled, uniform temperature and pressure, whereas 15 years ago, and before these small electrical refrigeration devices were available, the practice was to cool the product by circulating it through 40 feet or more of copper pipe embedded in ice. Under these conditions the product was too greatly chilled at time of small demand and insufficiently cooled during rush periods.

"The possible sale of electrical products, therefore, should range between \$35,000,000 and \$55,000,000, and the electrical manufacturing industry vitally needs this business.

"Producing, as it does, mainly capital goods, it is among those hardest hit by the present conditions. The statistics of the Department of Commerce show it to be operating in the third quarter of 1932 at less than 22% of its output in 1929 and at not more than 30% of its output in 1926.

"The effect in the industrial situation of the placing of \$50,000,000 of such business must be immediately apparent. Approximately 65% of such sale will go directly to the payment of wages, sal-

## Why Kelvinator Sales are Up in Hawaii



This troupe of native Hawaiian dancers furnished entertainment at a party held at the close of a sales school sponsored by the Weldsteel Supply Co., Hawaiian Islands Kelvinator distributor.

## PETRIE, TAYLOR HOLD MEETING IN CHICAGO

(Concluded from Page 1, Column 5)

school, at which there were delegations from Milwaukee and Peoria.

Representatives of the Wiswell Co. who attended the sessions were: R. E. Ford, L. C. Wiswell, Sr., L. C. Wiswell, Jr., H. Kennedy, J. C. Wiswell, D. J. Cortland, C. E. Swarts, M. H. Hammel, and F. Viola.

From the Radio Specialty Co. of Milwaukee came A. Van Antwerpen, John Mehr, V. L. Kelly, A. L. Stephenson, J. M. Record, L. A. Meyer, J. P. Forsthoepel, and W. W. Roth.

The Cohen Furniture Co., Peoria, was represented by M. F. Maroney, N. B. Williams, R. H. Hartley, and K. J. Scharpenberg.

Others in attendance were J. J. O'Neil, new business manager of Refrigeration Discount Corp.; J. A. Powers and Verne Martin, service men, and H. F. MacGrath, district manager.

### PORTLAND MEETING

PORTLAND, Ore. — Far western wholesale schools of the Leonard Refrigerator Co., presided over by District Managers J. B. Nicolson and H. E. Brazier, continued last week with the entire organization of the Cronin Distributing Co., distributor in this region, attending the sessions held here Thursday and Friday.

### SCHOOL IN SAN DIEGO

SAN DIEGO—Seven members of the organization of the Electric Supplies Distributing Co., Leonard distributor here, were in attendance at the factory-sponsored wholesale school held in San Diego recently.

They were L. Hall, president; F. G. Goss, vice president and general manager; B. Guthrie, secretary; Bart A. Murray, service manager, and Gene M. Cramer, Milton T. Taylor, and R. R. Jamison, salesmen.

Factory representatives who were in attendance and who participated in the instruction were H. E. Brazier and J. B. Nicolson, district managers who are conducting the Far Western series of schools; Charles W. Armstrong, vice president of the Refrigeration Discount Corp.; Bert Gibson, Refrigeration Discount Corp., and Frank W. Topping, service manager.

### LOS ANGELES

LOS ANGELES—Headed by H. E. Brazier and J. B. Nicolson, district managers of the Leonard Refrigerator Co., a factory crew of four conducted the company's wholesale school in this city recently, with members of the organization of Graham Hambly & Son, distributor here, in attendance.

Members of the distributor's organization present were Graham Hambly, president and manager; George Olds, service man, and B. D. Barnes, L. E. Kent, Ben Bartee and Harold Lawson, salesmen.

### DISPLAY TRUCK USED IN MAKING NORGE SALES

CHICAGO — The A. & A. Electric Supply Co., Norge dealer here for Sampson Electric Co., distributor, has sold 104 Norge refrigerators this year mainly through the use of a display truck, according to B. D. Greenhouse, assistant manager of the distributorship.

Salesmen for the A. & A. company take the Norge refrigerator to the home of the prospect by means of the display truck, and make a demonstration in the customer's home, states Greenhouse.

### REFRIGERATOR PAINTING USED ON G. E. CALENDAR

SCHENECTADY, N. Y.—A reproduction of an oil painting by Walter L. Greene of an all-electric kitchen is one of the pictures on the 1933 General Electric calendar.

More than 100,000 of these calendars are being distributed here and abroad, according to the publicity department of General Electric Co.

## Start the New Year with assured Coil Efficiency



Larkin Coils are available for over 6,000 installation combinations

## Now used in Well Over 38,000 Installations

The wisdom of these manufacturers of electric refrigeration equipment in adopting LARKIN 100% Vertical Surface Aluminum Plate COILS as STANDARD FACTORY EQUIPMENT is more clearly brought home each day . . . Dealers, distributors and users are becoming Coil Conscious. LARKIN COILS solve the problems of excessive Dehydration, excessive shutdowns for Defrosting, consistent with lower operating costs . . . Enjoy this powerful selling advantage for 1933. Manufacturers whose trade marks are shown here have facts of value for you.

LARKIN REFRIGERATING CORPORATION  
Originators and Manufacturers ATLANTA, GA.

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DETROIT, MICH.

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UNIVERSAL  
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KULAIR  
PHILADELPHIA, PA.

Zerozone  
DETROIT, MICH.

Modern  
DETROIT, MICH.

Starr  
DETROIT, MICH.

MOHAWK  
DETROIT, MICH.

Apex  
CLEVELAND, O.

DICELER  
DETROIT, MICH.

EXPORT  
DETROIT, MICH.



WRITTEN TO BE READ  
ON ARRIVAL

## Merchandising Section

IN TWO PARTS  
PART ONE

# ELECTRIC REFRIGERATION NEWS

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## OPERA STARS TO BE FEATURED ON G. E. RADIO HOUR

### New Programs to Have No Commercial Announcements

CLEVELAND—A new radio program without any commercial announcement and extending from coast to coast over 56 broadcasting stations of the National Broadcasting Company's red net-work was inaugurated Christmas day by the General Electric Co.

It is the plan of the General Electric Co. to star members of the Metropolitan Opera Co. on these programs which will be heard every Sunday from 9 until 9:30 o'clock.

The first broadcast presented Rosa Ponselle and also featured T. K. Quinn, vice president of the General Electric Co. in charge of refrigeration. In addition, the radio listeners were taken to the House of Magic in Schenectady, N. Y. for a brief visit with Dr. Ellis Manning, member of the research staff of the General Electric laboratories.

Future programs will feature such operatic stars as Lily Pons, Richard Bonelli, Tito Schipa, John Charles Thomas, John McCormack, Lucrezia Bori, and others of international reputation.

The former G. E. program which featured Heywood Brown, as master of ceremonies, Albert Payson Terhune, Arthur B. Reeves, Emily Post, and other guest stars of national prominence, has been discontinued. Its resumption in the near future is a matter of doubt.

Arrangements have been made for General Electric refrigerator distributors, dealers, and utility outlets to join with this program in their respective cities and towns.

The schedule of broadcasts for January, February, and March is as follows: Jan. 1, Lily Pons; Jan. 8, Richard Bonelli; Jan. 15, Tito Schipa; Jan. 22, Rosa Ponselle; Jan. 29, John Charles Thomas.

Feb. 5, John McCormack; Feb. 12, Lily Pons.

(Continued on Page 2, Column 5)

## 2 NEW DISTRIBUTORS ADDED BY LEONARD

DETROIT—To the list of Leonard distributors have been added Radio Specialty Co., 829 North Broadway, Milwaukee, Wis., and C. L. Hartmann Corp., 18-20 North Union St., Rochester, N. Y., by R. I. Petrie, general sales manager of the Leonard Refrigerator Co., announced last week.

The Radio Specialty Co., which is headed by A. Van Antwerpen, has been assigned all counties in Wisconsin south and east of and including Vernon, Janesville, Wood, Marathon, Lincoln, Oneida, and Iron and also all the counties in the northern peninsula.

The C. L. Hartmann Corp., of which Carl L. Hartmann is president, will operate in a territory consisting of eight counties in central New York state, with the exception of the city of Hornell in Steuben county. The counties, besides Steuben, are Monroe, Seneca, Yates, Livingston, Ontario, Wayne, and Schuyler.

## RADIO SKIT BOOSTS XMAS SALES OF OKLAHOMA FIRM

OKLAHOMA CITY—Christmas sales of the Tom Cooper Motor Co., Kelvinator distributor here, were increased as the result of a comedy skit which the company sponsors on radio station KOMA twice a week.

"Martin and Dumb Dutchman" is the title of the skit, which features Martin, the Kelvinator salesman, played by Sales Manager M. L. Cowan, and the Dutchman, portrayed by Harry Wolff of the sales staff.

The skit deals with the attempts of Martin, the salesman, to sell Wolff an electric refrigerator for the latter's wife, Katrinka. The humorous dialogue has brought favorable comment from the station's listeners, has widely advertised the Tom Cooper Co., and resulted in an upturn of the Christmas sales curve, according to Sales Manager Cowan.

## Refrigerator Tax Yields \$113,963 In November

WASHINGTON, D. C.—The Federal Revenue tax on mechanical refrigerators for November amounted to \$113,963.78, a decrease from the total of \$201,896.25 collected in October, according to figures recently made public by the Bureau of Internal Revenue.

Income from the sale of radios and phonograph records increased during November, the tax amounting to \$298,577.86 as compared with \$218,722.70 in October.

The 24 new excise and stamp taxes of the Revenue Act of 1932 yielded \$32,800,000 during the month, increasing the income of the government from \$59,098,356 in November, 1931, to \$85,484,476 in November of this year.

## 50 ATTEND LEONARD WHOLESALE SCHOOL

KANSAS CITY—Despite the rigors of sub-zero weather, more than 50 Leonard distributors and members of their organizations assembled at the Phillips hotel here Friday, December 16, for one of the series of two-day wholesale schools which the Leonard Refrigerator Co. is holding.

As in all the middle-western and eastern schools, a factory "flying squadron," headed by R. I. Petrie, sales manager, and A. M. Taylor, merchandising director, conducted the sessions.

They were assisted by J. J. O'Neil, new business manager of the Refrigeration Discount Corp., and R. M. Martin of the service department.

Sales Manager Petrie, at the close of the meeting here, expressed elation over the success of the schools so far and the attendance that has been recorded.

"The importance of these meetings to Leonard dealers and salesmen lies in the fact that wholesale men are being trained to be more helpful to them in the methods and procedure of selling our product," he declared.

"No phase of the domestic refrigeration business is left untouched. No one is told to be enthusiastic; the wholesale men become so because of the 'meaty' material that is furnished."

An unusual feature of the Kansas City meeting was the attendance of a large number of retail men from the Mace-Ryer organization.

Mace-Ryer men in attendance were H. D. Cooper, M. Rozell, Gordon Jense, Walder Ehman, D. C. Schmid, B. F. Thomas, C. C. Jones, L. L. Andrews, Buddy Nelson, George S. Reynolds, Dave Lakin, A. L. Stall, Normen Wilson.

(Continued on Page 2, Column 4)

## BOTTENFIELD JOINS NORGE COMPANY OF MISSOURI

ST. LOUIS—A. E. Bottenfield, formerly of Strong, Carlisle & Hammond, Cleveland Norge distributor, has been appointed general manager of the Norge Co. of Missouri, according to A. H. Crow, president of the company.

## TRICOLD ORDERS 10,000 MACHINES FROM UNIVERSAL

### G. M. Johnston Endorses Tricold Policy; Rex to Make Cabinets

DETROIT—G. M. Johnston, president of Universal Cooler Corp., has just returned from Buffalo where he obtained an order from Tricold Refrigerator Corp. for 10,000 units, being the initial order of the Tricold Company's 1933 program.

Mr. Johnston expressed himself as being pleased with the plan of operation of the Tricold company. He said: "This company proposes bringing out high quality merchandise, and proposes to price its product commensurate to its quality and value."

"This is the first indication which has come to my attention of a company in the refrigeration industry which will ignore the low-price field and devote itself exclusively to quality and performance. There is no doubt in my mind but that the policy established by the Tricold Refrigerator Corp. will react to the benefit of the industry as a whole, as in the past there has been altogether too much inclination of manufacturers to bring out low-priced products rather than to give the public temperatures and valuable features for which they are prepared to pay."

"I have watched the development of the Tricold Co., and am satisfied this company is fully qualified to take its proper position in the industry," states Mr. Johnston.

### Rex Cabinets Ordered

CONNEERSVILLE, Ind.—C. C. Hull, president of the Rex Mfg. Co., announces that his company has received an initial order from Tricold Refrigerator Corp., of Buffalo, for 10,000 cabinets for which they are now tooling up. Rex officials expect to be in production on these cabinets about Jan. 15.

## ST. LOUIS DEALERS SHOW PERFORMANCE OF UNITS

ST. LOUIS—Three inexpensive, practical recording instruments comprise the equipment of a new selling method being used by Norge dealers here, according to A. H. Crow, president of the Norge Co. of Missouri.

These instruments are a thermometer which records temperatures over a 24-hour period inside the refrigerator, another thermometer outside the cabinet to record room temperatures for the same period, and an operation recording device which shows the percentage of time the cooling unit operates.

## Brings Home the Venison



C. V. Di Pietro, Liquid Cooler Corp. eastern division manager, returns with a carload of deer, bear, and partridges after a combination business and hunting trip to the Province of Quebec

## Servel To Introduce Low-Priced Line

### 'Crusader' Line to Include 5 Conventional Models; 4 Cu.-Ft. Unit Sells for \$112 Plus Freight

EVANSVILLE, Ind.—On Jan. 1, Servel Sales, Inc., will place on the market a five-model line of household electric refrigerators of conventional design ranging in price from \$112 to \$235 (all prices installed, plus freight), according to C. A. Miller, sales manager. The new refrigerators, which will be known as the "Crusader" line, will be sold as a "companion line" to Servel's hermetic units.

### Announces Line



C. A. MILLER  
Servel sales manager describes the company's new conventional units.

## Apex Appoints 11 Field Men

CLEVELAND—Eight new junior salesmen and three district managers have been appointed by the Apex-Rotarex Corp. to help Apex dealers, according to C. G. Frantz, president and general manager.

A 12-day school was held for the men before they were sent into the field. J. M. Michael, Apex educational director, conducted the course which covered phases of Apex appliance selling.

The new managers and the districts to which they have been assigned are as follows: H. C. Kirby, Albany, N. Y.; J. R. Stewart, Providence, R. I.; and Carl A. Bachman, Youngstown, Ohio.

Junior salesmen appointed are being located in centers where they will work directly under the supervision of district managers. The men appointed and the cities where they will go are:

F. E. Dunn, New York City; T. J. Foley, Boston; E. E. Dowden, Philadelphia; G. C. Towle, Detroit; J. A. Parker, Chicago; Scott Rexinger, Chicago; V. A. Hunter, Dayton, and W. A. Griffith, Cleveland.

## LEONARD CABINET PLANT WILL PUT 800 TO WORK

GRAND RAPIDS, Mich.—Leonard refrigerator plant, here, unit of Kelvinator Corp., Detroit, will call between 800 and 900 men back to work Jan. 3, according to Frank D. Brebner, manager of the plant.

It was planned originally to open the factory Jan. 9, but production needs necessitated opening it a week earlier, states Brebner. Only former employees were hired.

### ALLEN MADE WESTINGHOUSE DISTRICT MANAGER

MANSFIELD, Ohio—C. E. Allen, formerly commercial vice president of Westinghouse Electric & Mfg. Co., refrigeration division, has been appointed southwestern district manager of Westinghouse with headquarters in St. Louis, according to R. E. Imhoff, sales manager of the merchandising division.

## CONTEST MANAGERS TO RECEIVE PRIZES

DETROIT—Substantial prizes, sponsored by Vance C. Woodcox, advertising and sales promotion manager of Kelvinator Corp., went to 20 additional distributors' contest secretaries in the field last week as rewards for their work during the Christmas sales campaign.

To each man was dispatched a fitted toilet set and to each woman a desk set. The 20 recipients of the Woodcox prizes and their companies are:

W. T. Reace, Commonwealth-Edison Co., Chicago; Mrs. B. E. McDonough, Southern Public Utilities Co., Charlotte.

(Continued on Page 2, Column 4)

## ST. LOUIS DISTRIBUTOR TO TEST NEW SALES PLANS

ST. LOUIS—R. H. Wilson, sales manager of the Arthur R. Lindburg Co., Westinghouse refrigerator distributor here, has two new plans which he will try on his sales force beginning Jan. 1, 1933.

Plan number one is to have two salesmen contact each person entering the company's showroom. "We have experienced, in the past few months, that two men working as a team and having been coached together on demonstrations and closing, produce far more business than a single man on the floor," Wilson says.

The second idea is to have a supervisor make out the daily reports for each salesman. This will enable the supervisor to get each salesman's records for the previous day, and help each man plan his work for the current day, according to Wilson.

## Gentsch Sells Interest In G. E. Distributorship

BOSTON—C. D. Gentsch of Gentsch & Thompson, Inc., General Electric distributor here, has sold his interest in the distributorship to W. L. Thompson, his partner, according to G. M. Craig, vice president in charge of sales promotion and advertising for the firm.

Thompson will assume full control and management of the business, and Gentsch plans to return to Cleveland where he resided previous to his coming to Boston in 1930.



# THERE IS

# ONLY ONE

# Humidraft

... AND IT ALONE CAN BRING YOU  
ALL THE SELLING ADVANTAGES OF  
TRIPLE-CONTROLLED REFRIGERATION

**H**UMIDRAFT'S sweeping success in the field of forced-draft commercial refrigeration has prompted many imitations.

But there is still only one genuine Humidraft chilling unit. Only one Humidraft that will give you customers accurate control of temperature, humidity and circulation in commercial refrigerators. Only one Humidraft that you can sell with confidence, and install with the assurance of perfect performance.

Servel's Humidraft is the outgrowth of years of research. Scientifically engineered for maximum efficiency, it combines the correct balance of tube size and fin surface with a large, slow-speed fan to keep the air in commercial refrigerators cold and moist and MOVING.

Beware of "imitation" units that have been hurriedly and haphazardly assembled for a competitive market. Not only do they fail to achieve the full benefits of triple-controlled forced-air refrigeration, but such units involve the needless risk of high service costs and dissatisfied customers.

Remember—there is but one genuine Humidraft. Only Servel—backed by a decade of leadership in the refrigeration industry—has it. And only Servel dealers are licensed to sell it.

Find out what compelling sales arguments Servel's Humidraft has brought to alert dealers in every section of the country. Find out how you may acquire the profitable Servel Commercial franchise if it is still available in your city. Write today for full information. Servel Sales, Inc., Evansville, Ind.

# SERVEL

# Humidraft

## COMMERCIAL REFRIGERATION

### Leonard Meeting Held In Kansas

(Concluded from Page 1, Column 2)

George Likens, Cecil C. Rounds, L. R. Allen, G. Hedrick, H. Stewart, W. W. Schofield, Albert Bell, H. O. Price and Thomas B. Anderson.

Distributor organizations were represented as follows:

Spurrier's, Inc., Oklahoma City—J. P. Stewart, Paul G. Smith, D. Ray Finnegan, and E. E. Brammer.

Stimpson Sales & Investment Co., Wichita—E. T. Legg, E. L. Stimpson, and George H. King.

A. A. Schneiderhahn Co., Des Moines—E. J. Kerby, G. W. Onthank, Louis K. Wild, E. L. Clinker, Al Faulstich, and A. A. Schneiderhahn.

McGregor's, Inc., Memphis—John W. Evans and R. J. Martinette.

E. C. McKelvey Radio Co., Salina—Hal Heaton, Ralph Patrick, Carl Schwenson, and I. K. Deeds.

Aeolian Co. of Missouri, St. Louis—G. M. Warole, R. K. Brandenberger, H. J. Free, R. J. Poler, and G. S. Scofield.

Auto Equipment Co., Omaha—M. S. Livingston.

General Supply Co., Springfield, Mo.—L. E. Allmon and Max Van Hook.

### POTTERS GROUP FLAYS USE OF 'PORCELAIN ENAMEL'

NEW YORK CITY—The use of the term "porcelain enamel" by electric refrigerator manufacturers to describe the finish of their products was condemned by Dr. A. V. Bleining, chairman of the research committee of the United States Potters Association, at its convention held here recently.

Dr. Bleining explained that porcelain is made from a clay base, while the finish used by electric refrigeration manufacturers is merely covered metal. A special committee headed by Dr. Bleining was appointed by the association to investigate the matter.

A campaign to point out defects of products made by the General Electric Co., Westinghouse, and DuPont from synthetic phenolic resin, which are competitive to the pottery industry's goods, was previously urged by Dr. Bleining.

"Earthenware" is likewise a misleading term, according to the doctor, and should be replaced by "vitreous" or "semi-vitreous" ware in descriptions for tariff classification and general law purposes.

### DEPARTMENT STORE SELLS FRIGIDAIRE UNITS FOR \$105

DETROIT—As a feature of its holiday electrical appliance sale, J. L. Hudson & Co., department store here, is selling 1932 all-porcelain 4.1-cu. ft. Frigidaires at \$105. These are repossessed units, according to J. B. Ogden, manager of the electrical appliance division.

Similar Frigidaire models, used as demonstrators on the floor, are being sold at \$125. Other 1932 4.1-cu. ft. units, with lacquer cabinets, are priced at \$105.

The store is also offering 4-cu. ft. 1932 model Kelvinators with apartment house (lacquer) cabinets for \$89.50, and 6-cu. ft. 1932 models in the same type of cabinet for \$119.50.

All of these refrigerators are being offered at terms of: \$10 down, and 12, 18, or 24 months to pay the balance.

### LEONARD CO. APPOINTS 22 REFRIGERATOR DEALERS

DETROIT—Twenty-two new dealers have been appointed by the Leonard Refrigerator Co.

The new dealers, by states, follow: Pennsylvania—Huggins Radio Shop, Hanover; A. G. Pike, Upper Darby; L. W. West, Perkasie; Mort Farr, Inc., Drexel Hill; Patterson Bros., Butler.

New York—Albert R. Earley, Wells; T. J. Farone, Inc., Saratoga Springs; Auburn Refrigerator Corp., New York City; Adams Flanagan Co., New York City.

New Jersey—Edgar G. Buchanan, Flemington; Servu Appliance Co., High Bridge; Vermont—Fenton & Hennessey, Bellows Falls; F. W. Barrett, Rutland; F. W. Barrett, Poughkeepsie; W. G. Reynolds Co., Burlington; H. J. Bashaw, Stowe.

Illinois—Goodale Puffer Grocery Co., Centralia; Vollmer Brothers, LaSalle; E. E. Bronson & Co., Blue Island.

Missouri—General Radio and Electric Supply Co., St. Louis; Indiana—Mason Radio and Electrical Service, Greencastle; Virginia—John W. Yowell and Co., Culpepper.

### L. E. LATHAM SHOTS 6-POINT BUCK ON HUNTING TRIP

NEW YORK CITY—L. E. Latham, president of E. B. Latham & Co., Leonard distributor here, recently drove up Fourth Ave. with 187 lbs. of venison draped over his bumper and headlights.

Latham shot a six-point buck during a week-end hunting trip in northern Maine. He was accompanied by his brother Earl.

### OPERA STARS APPEAR ON G. E. BROADCAST

(Concluded from Page 1, Column 1)

Pons; Feb. 19, John Charles Thomas; Feb. 26, Tito Schipa.

Mar. 5, Rosa Ponselle; Mar. 12, Richard Bonelli; Mar. 19, John McCormack; Mar. 26, Lucrezia Bori.

The General Electric Broadcasts may be heard over the following stations:

WEAF, New York City; WEEI, Boston; WTIC, Hartford, Conn.; WJAF, Providence, R. I.; WTAG, Worcester, Mass.

WCSH, Portland, Me.; WFI, Philadelphia; WFBR, Baltimore; WRC, Washington; WGY, Schenectady, N. Y.; WEEN, Buffalo, N. Y.

WCAE, Pittsburgh; WTAM, Cleveland; WWJ, Detroit; WSAI, Cincinnati; WENR or WMAQ, Chicago; KSD, St. Louis.

WOC, Davenport, Iowa; WHO, Des Moines, Iowa; WOW, Omaha; WDAF, Kansas City, Mo.; KSTP, Minneapolis-St. Paul, Minn.

WTMJ, Milwaukee; WIBA, Madison, Wis.; WEBC, Duluth-Superior, Minn.; WDAY, Fargo, N. D.; KFYZ, Bismarck, N. D.; WRVA, Richmond, Va.

WPTF, Raleigh, N. C.; WWNC, Asheville, N. C.; WIS, Columbia, S. C.; WJAX, Jacksonville, Fla.; WFLA, WSUN, Tampa, Fla.; WIOD, Miami, Fla.

WHAS, Louisville; WSM, Nashville, Tenn.; WMC, Memphis, Tenn.; WSB, Atlanta; WAPI, Birmingham, Ala.; WJDX, Jackson, Miss.

WSMB, New Orleans; KVOO, Tulsa, Okla.; WKY, Oklahoma City; KTHS, Hot Springs, Ark.; WBAP, Fort Worth, Tex.; KPRC, Houston, Tex.

WOAI, San Antonio, Tex.; KOA, Denver; KDYL, Salt Lake City, Utah; KGO, San Francisco; KFI, Los Angeles.

KFSD, San Diego, Calif.; KTAR, Phoenix, Ariz.; KGW, Portland, Ore.; KOMO, Seattle; KHQ, Spokane, Wash.

### ALLEN - INGRAHAM SELLS 1,819 UNITS IN 5 ORDERS

NEW YORK CITY—The apartment house sales division of Allen-Ingraham, Inc., Westinghouse refrigerator distributor here, recently sold 1,819 refrigerators in five orders.

K. M. Peabody sold 751 refrigerators to Weisman & Ackerman, while V. V. Lebedeff secured a contract from the J. H. Taylor Management Co. for 400 refrigerators.

G. M. McCluskey obtained a contract from the St. Mary's Park Realty & Construction Co. for 348 units, while G. E. Luters, district manager of Manhattan, sold 160 to the Hotel Esplanade, and J. Fieldsteel, who is leading all salesmen in the United States as a Quota Buster, sold 160 units to the Hotel Oliver Cromwell.

### TOLEDO DISTRIBUTOR USES BUS FOR DEMONSTRATIONS

TOLEDO—A Good-Will Tour bus, carrying salesmen and entertainers, and telling the Westinghouse refrigerator story, recently made a two-month tour of country fairs and small towns in this territory under the auspices of J. W. Greene Co., Westinghouse refrigerator distributor here.

During the day the bus would parade about a town, playing music and attracting attention by means of loud speakers. In the evening a stand would be made in front of the dealer's store, where announcements concerning the Westinghouse unit would be made.

The recent Westinghouse National Letter Contest was well talked up during the announcements. Newspapers in the various towns visited gave the project a good amount of publicity, both dailies and weeklies in the territory, carrying pictures and write-ups.

### KELVINATOR GIVES PRIZES TO CONTEST SECRETARIES

(Concluded from Page 1, Column 1)

N. C.; Miss V. Harner, Columbus Distributing Co., Columbus, Ohio; W. E. Bodart, Morley-Murphy Co., Green Bay, Wis.; F. H. Elvig, Northwestern Public Service Co., Huron, S. D.

Miss M. Vogel, Morley-Murphy Co., Milwaukee, Wis.; T. E. Leonard, Power Furniture Co., Portland, Ore.; Beatrice MacKinnon, Post & Lester Co., Providence, R. I.; Charles T. Smith, Kirk Meyer Electric Co., Richmond, Va.

Ruby Van Meter, Pearson Piano Co., Indianapolis.

P. A. Zeck, Careva Co., York, Pa.; Gertrude Bennett, Stambaugh-Thompson Co., Youngstown, Pa.; Helen MacKinnon, Casper Supply Co., Casper, Wyo.; Roy Turney, H. E. Sorenson Co., Des Moines, Ia.; Miss Winifred Nick, Briggs, Hagenlocher Co., Erie, Pa.

Arthur N. Klebes, Rackliffe Brothers Inc., New Britain, Conn.; B. C. McCoy, Clark & Jones, Birmingham, Ala.; Alice Goreau, Philip Werlein, Ltd., New Orleans; Rita Burns, Meachem-Fenn, Inc., Syracuse, N. Y., and Harry Frank, Tri-State Electric Co., Sioux Falls, S. D.





# ★ ★ ★ ★ Permanency ★ ★ ★ ★

*"WEAK and unlucky companies have fallen, but the stronger, the better managed, and the more fortunate remain . . . and give every sign of ability to remain in business indefinitely . . . if you were asked to name the four greatest U. S. Corporations you might very well include the General Electric Company . . . G-E can weather any depression without having to weather any crisis . . . Today the electric-refrigerator business is roughly one-third G-E."*

—Fortune Magazine, Nov. 1932.

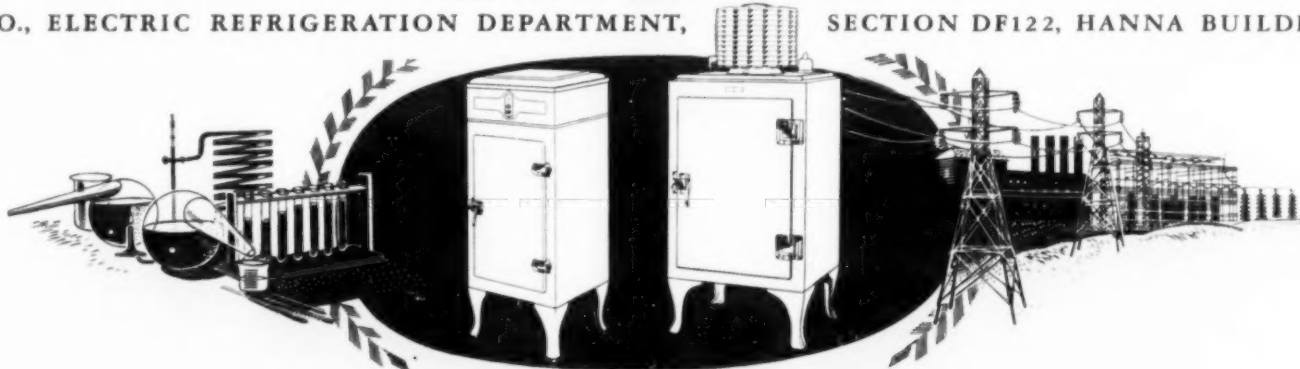
Permanence, stability, reliability, assurance that a manufacturing company will continue in business . . .

all of those things mean a great deal to the retailer. The G-E Refrigerator retailer knows that General Electric Company is in business to stay . . . that it was founded upon the solid rock of permanence. It was here two-score years ago. It will continue for the years to come. The retailer . . . and the buyer . . . knows that General Electric is proud of its reputation as a manufacturer of quality products and equally

proud of the service its products give the consumer. General Electric—one of the world's greatest industrial organizations . . . and the world's greatest electrical manufacturing company . . . offers this assurance of permanence to retailers upon which they can build good will, sales and profits for themselves. And the G-E Refrigerator assures reliable, dependable service to the buyer. Today one out of every three domestic electric refrigerators in use is a General Electric—a fact which reflects the overwhelming public preference for the General Electric.

**GENERAL  ELECTRIC**  
ALL-STEEL REFRIGERATOR

GENERAL ELECTRIC CO., ELECTRIC REFRIGERATION DEPARTMENT, SECTION DF122, HANNA BUILDING, CLEVELAND, OHIO





## MERCHANDISING SECTION ELECTRIC REFRIGERATION NEWS

The Business Newspaper of the Refrigeration Industry

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### Uniform Practice

SEVERAL months ago this editorial column went on record as favoring the uniform practice of quoting refrigerator sizes in terms of net cubic feet capacity, as opposed to gross cubage.

Since that time scarcely any complaints have come in relative to the unfair competition found earlier in the season when some manufacturers were making capital of their "lower" prices (based on gross cubage) to the discomfiture of other manufacturers who were quoting net cubage.

Comes now the opportunity to recommend another uniform practice, that of die-stamping numbers into the wood or metal of the cabinet, instead of affixing such identification to boxes by means of a metal plate. This uniform practice is recommended by L. Y. McAnney of the Commercial Investment Trust Corp., New York City.

In view of the importance of the deferred payment market for automatic refrigerators, it seems reasonable to Mr. McAnney that cabinet manufacturers should be receptive to suggestions which might point the way toward safeguards for this overwhelming portion of sales to ultimate users.

#### Identification of Equipment

Retail time payment financing is closely tied up with wholesale financing, by means of which the dealer places refrigerators on his floor for resale, under a trust receipt and time obligation. Instead of paying the full invoice price in cash to the manufacturer for his floor models, the dealer makes a deposit on them and signs a time draft for the unpaid balance.

Any equipment financed by this wholesale method (or at retail, for that matter) must be identified to establish title. Such identification for electric refrigerators is established by means of serial numbers on the cabinet and on the refrigerating unit.

To protect manufacturing organizations which support a dealer's wholesale finance program, the finance company must "floor check" the equipment which is yet "open" under the plan, to make sure that the equipment is still on the dealer's floor and has not been sold "out of trust." This checking is accomplished by comparing cabinet and unit serial numbers on the equipment with those recorded on the lien instrument.

#### Juggle Nameplates

Some cabinet manufacturers have been affixing serial numbers to their boxes by means of a metal plate which is tacked into the wood. Unscrupulous operators may then substitute one plate for another, or juggle nameplates in various ways to deceive the finance company representative who checks the equipment.

Mr. McAnney believes that if all cabinet manufacturers were to follow the simple shop practice of die-stamping serial numbers right into the cabinet, substitution or misrepresentation might be avoided. And, Mr. McAnney observes cannily, it might cost less than affixing nameplates.

The suggestion is offered for what it is worth. Inasmuch as the idea is designed to help circumvent some of the difficulties of financing the sale

of electric refrigerators—and financing problems offer some of the biggest stumbling blocks in the path of this progressive industry—it merits due deliberation.

### Dealers' Suggestions

REFRIGERATION manufacturers have been consulting dealers more than ever this winter for suggestions as to what should be done about national sales and advertising programs, features to be incorporated in new lines, and other matters of policy.

They have found in many instances that their dealers were able to furnish workable ideas, ideas that gave them a new and helpful slant on some of their major problems. And they have begun to encourage their dealers to send ideas and suggestions to the factory for consideration.

#### Patterson Used Employees' Suggestions

Early in his career as president of the National Cash Register Co., the late John H. Patterson, whose contributions to the technique of specialty selling earned for him the cognomen, "daddy of modern sales management," inaugurated in his factories what he called "employees' suggestion boxes."

He encouraged everyone, from research experts to janitors to jot down ideas for improvement of the company and put them in the boxes. He paid well for every idea that could be utilized.

Later, he said his suggestion boxes revealed that his employees were a mine of constructive ideas. Suggestions from his employees, he declared, were responsible for practically every improvement made in the National cash register over a long period of years, and led to discovery of many persons suited for important executive positions in the company.

#### Constantly Seek Improvement

Although strictly speaking, refrigerator dealers are not employees of their manufacturers, they are in a position to gain some impressions of the industry which might be helpful to manufacturers who are working constantly to improve their product and sales methods. Dealers think seriously about the industry because their living depends upon the progress it makes.

One thing in particular qualifies the average dealer to be a valuable source of ideas and information for the manufacturer. Every manufacturer is making a product for public consumption. If he is to build a refrigerator with attractive features and high sales appeal, he must be aware of what the public is demanding.

As this column pointed out following the A.S.R.E. winter convention in New York, "most leading manufacturers have in their laboratories fully developed rotary, reciprocating, open, and sealed compressors, and even absorption systems. *Whichever way the wind of public preference may veer, they are all set for it.*"

#### Dealers Know Trends

Many dealers are in a position to sound and report trends in this public preference which are all-important to manufacturers. With the exception of retail salesmen, dealers are closer to the public, more constantly in contact with consumers than any other members of a manufacturing-and-sales organization.

Yet frequently, dealers' opinions and reports on the public's changing tastes reach the factory by a roundabout way—through distributors or field representatives. Second-hand versions of new tastes often lack flavor of fresh, original, first-hand reactions, and are likely to be adulterated.

Many dealers are so interested in the overall programs of the manufacturer they represent that they take great delight in volunteering suggestions. Encouragement of this type of dealer will almost invariably result in his amplified loyalty to the organization he serves, and the increased concentration of his attention on selling the product.

It will probably be necessary to stimulate other types of dealers by offering substantial prizes for practical suggestions. Whatever the method of generating and spurring contributions of suggestions from dealers, the results will no doubt more than justify the time and money spent in cultivating the field.

### Westinghouse Book Tells Value of Food Survey

MANSFIELD, Ohio—Just off the press is a new 23-page booklet, "It Pays for Itself," issued by the refrigeration department of Westinghouse Electric & Mfg. Co. as Volume 5 of its refrigerator salesmen's library.

This little manual points out the value of the company's food preservation survey form as a sale-maker, and gives complete instructions, with examples, for using it on each sales attempt.

The form, when completed for each prospect, shows how much she will save in a two- or three-year period by using a Westinghouse. Savings result, the form indicates, from the unit's elimination of ice costs and food wastage, and its enabling the user to buy foods in larger quantities at a saving.

Closing each form is another estimate of savings effected by the refrigerator during a 10-year period. These estimates of savings, says the booklet, will facilitate sale closures by justifying, for many prospects, the immediate purchase of an electric refrigerator.

Final words of the manual are: "Present this cash saving forcefully... with a vivid description of the convenience, utility, pleasure... and health-protecting qualities... and you'll get more business."

### GENERAL ELECTRIC GETS LUNCHEON CLUB CONTRACT

NEW YORK CITY—One of the largest single orders yet to be recorded by the commercial refrigeration department, Rex Cole, Inc., General Electric distributor here, is the contract recently secured from the Aldine Luncheon club, 200 Fifth Ave., by J. A. E. Steen, salesman in J. Frank Vernon, Jr.'s division.

A three-compartment storage refrigerator, equipped with two D-54's and four DE-55's will take care of the bulk of the food kept on hand by the club. For the chef's special use, a D-55 was installed.

Two garde-mangers, each equipped with a D-41, will supplement the large three-compartment cabinet. Two D-34's, complete with fin coils, each chill a cabinet designed for special duty. One is the pastry box; the other, lined with rack upon rack of shallow shelves, is for the sole purpose of serving oysters, and keeping them perfectly chilled until they are placed before the guests.

An eight-hole ice cream cabinet, equipped with a D-54 completes the units selected by the management of the Aldine club.

L. Howard Jenks, Jr., manager of the commercial department, and in whose province this comprehensive order falls, highly commended Steel and Vernon.

The Aldine club is an exclusive and long established organization on Fifth Ave., and is famous for the excellence of its cuisine. The installation of General Electric equipment there this month was the result of a general redecoration throughout the club.

### Mace-Ryer Pays Clubs To Attend Schools

KANSAS CITY, Mo.—Mace-Ryer Co., local Leonard electric refrigerator dealer, has secured large attendance at its daily appliance demonstrations and cooking schools by paying clubs for the presence of their members, according to C. C. Jones, manager of the appliance department.

With regard to this plan of reaching club women, Jones states: "We discovered, early in our efforts along this line, that some women's organizations have been over-commercialized and have become professional attenders at paid demonstrations. As a result, we have become careful in our selection of groups."

"Before inviting an organization, we try to discover just how many demonstrations the group has attended previously. We no longer accept offers made to us."

More than 100 women attend the daily sessions, according to Jones. Gertrude M. Furgason is the home economist in charge. The one-hour morning session, starting at 10 o'clock, is opened by Jones with a talk on electric refrigeration. The meeting is then turned over to Miss Furgason who conducts the cooking school.

In the afternoon, another one-hour session is held, and this is attended by church and club women.

### Cronin Co. Uses Truck To Show Lines

PORTLAND, Ore.—A. M. Cronin, Jr., president of Cronin Distributing Co., Inc., distributor of Leonard electric refrigerators, Electrochef electric ranges, Crosley radios, and Voss washing machines, has designed a display car in which representative models of the Cronin line are being shown. The display car body was built by Wentworth and Irwin and was mounted on a GMC truck chassis.

### SECURITIES COMPANY TELLS 1933 OUTLOOK

NEW YORK CITY—"The refrigeration outlook for the early part of 1933, is not auspicious, clouded as it is by the competitive situation and by the possibility of a moderately lower level of sales volume," is the forecast for the refrigeration industry issued by Standard Trade and Securities.

"A substantial potential market still remains to be exploited," the statement points out, "and distribution reasonably may be expected again to expand promptly with recovery in public purchasing power."

With regard to Kelvinator Corp., the financial paper states:

"Unit sales of household refrigerators during the past fiscal period were the largest in the company's history, but sales of commercial units declined sharply. Profit margins on the entire output were all but eliminated by the severe price competition which prevailed in the industry..."

"Although relief from adverse trade conditions is not yet in sight, Kelvinator has strengthened its position in the industry and should participate fully in the large future development anticipated for mechanical refrigeration."

"Meanwhile, the financial condition remains strong, the stock having a net current asset value approximately equal to its market price. Because of the issue's deflated status, the possibilities of medium term appreciation are believed to outweigh the risks involved. Early resumption of dividends is extremely unlikely, however."

Statement of Standard Trade and Securities on Servel, Inc., is as follows:

"Sales of commercial refrigerating units have dropped sharply this year, and competition in the electric household refrigeration field has become sufficiently severe to practically eliminate profit margins. Although the company's interest in these lines is not particularly large, the unfavorable conditions therein, together with moderate cuts in the prices of Electrolux machines, caused a loss of 15 cents a common share, against a profit of 50 cents a share for the similar period last year."

"Gas refrigerators, sold under the trade name Electrolux, constitute the bulk of Servel's output, although Hermetic electric refrigerators, gas engines, automobile truck bodies, and engine castings are also manufactured."

"Income from products other than refrigerators was eliminated by the depression, but until 1932 this loss was more than offset by the steady growth in refrigerator profits."

"Funded debt and preferred stock are relatively small. Dividends on the preferred were paid throughout the current year; inasmuch as the issue becomes cumulative Jan. 1, 1933, and the cash position of the company is satisfactory, disbursements may be continued."

With regard to the ice industry the report states: "It is doubtful that aggregate income of the industry will ever attain former heights, because of the prospect for steadily increasing competition from mechanical refrigeration."

### HAWAIIAN ISLANDS APPEAR AS GOOD MARKET FOR 1933

HONOLULU—The Hawaiian Islands are enjoying a prosperity all their own, and, as a result, the year 1933 bids fair to be an excellent one from the standpoint of electric refrigerator sales, both household and commercial, according to Paul Stermer and John W. Dassell of the Weldsteel Supply Co., Kelvinator distributor for the South Seas territory.

The improved market is due to federal expenditures for the army and navy and for fortifications, according to Stermer and Dassell. Furthermore, both sugar and pineapple plantations have yielded good crops.

Dassell boasts the distinction of being the dean of electric refrigerator salesmen in the island group. There were only three mechanical refrigerators in all Hawaii when he began selling in Honolulu.

### Rex Cole Chauffeur Makes Two Sales

NEW YORK CITY—The fact that good salesmanship is not confined strictly to the sales departments of Rex Cole, Inc., General Electric distributor here, was brought to light recently when C. Scully, one of the chauffeurs of Wm. A. Fisher, manager of the product department, not only delivered the goods but sold them as well.

In November, Scully reported that he had unearthed two prospects, Mary Gentile and Mary Lupola, both of Long Island City. He requested that they both be contacted at once.

Less than two weeks later, Mrs. Gentile bought a General Electric washing machine and Mrs. Lupola bought a General Electric refrigerator, model S-67. Mrs. Gentile also made it known that she is a prospect for a Monitor Top in the near future.



## DOOR-TO-DOOR SALES VALUED AT 2 MILLION

CHICAGO — Manufactured products valued at more than \$2,000,000,000 at their point of production were sold direct to the consumer by house-to-house or direct-to-user salesmen in the United States in 1931, according to the results of a survey announced by *Specialty Salesmen Magazine*.

The survey shows that direct-to-the-consumer sales in 1931 increased over 1930 and were double the only disinterested estimate of 1929.

The Department of Commerce recently reported that 1930 direct-to-the-consumer sales totalled \$1,891,828,000 in factory value, and the United States Chamber of Commerce previously estimated that 18,000 manufactured products valued at approximately \$1,000,000,000 were sold direct to consumer in 1929.

The present degree of stagnation of over-the-counter sales caused by economic conditions, the determination of many manufacturers to move their products more aggressively, and the mounting cost of jobber-wholesale distribution are principal causes for the increase in direct sales," the article states.

## 30 REX COLE EMPLOYEES JOIN SALES FRATERNITY

NEW YORK CITY—Thirty members of Rex Cole, Inc., General Electric distributor here, will be honored by Fred Harvey, General Electric district manager, by induction into the Delta chapter of the Eastern District Sales Fraternity.

Four executives, Rex Cole, president; Robert Stevenson, vice president and general manager; E. Hamilton Campbell, manager sales promotion department; and Paul H. Hichborn, manager of the retail department, are among those honored.

The following members of the retail department will be initiated: Albert Y. Tucker, Philip S. Weiner, John H. Connelley, Joseph A. Cormier, Andrew W. Zoltac, Elmer Van Name, Jr., Manuel Reina, Frank K. Taft, Walter P. Pentz, Carl A. Carlson, Paul C. Meyer, and John S. Sterling.

Members of the wholesale department to be taken into the fraternity include: George R. Lampert, Albina Zavis, George Trepass, Victor DeMouth, J. H. Christensen, and John Travis.

Harold P. Balston, Charles Inman, J. A. E. Steen, and A. B. Salto have been selected from the commercial department.

Edward A. Mullen, Ernest P. Lull, Clarence J. Robbins, and Charles W. Witherspoon have been chosen representatives of the apartment house division.

## NIAGARA POWER TO HELP DEVELOP APPLIANCE SALES

BUFFALO—A promotional plan for the development of residential and farm electrical markets in cooperation with merchants who sell electric and gas appliances has just been completed by the Niagara Power Corp. which recently withdrew from the electrical merchandising field (*ELECTRIC REFRIGERATION NEWS*, Dec. 7), according to Merrill E. Skinner, chairman of the sales promotion committee.

An intensive training course for the companies' field representatives to show them how to help customers in electrical and gas problems will be inaugurated. Company stores will be converted into continuous appliance shows with practically all standard makes of appliances on display, according to Skinner. No sales will be made by the utility, however.

A newspaper advertising campaign in cooperation with the dealers, promoting the use of electricity and gas in the home is being planned by the utilities. Public classes in cooking and homemaking will be sponsored by the companies in support of the merchants.

## 85 WESTINGHOUSE UNITS INSTALLED IN HOTEL

CHICAGO—The Westinghouse Electric Supply Co. of this city recently secured an order for 85 model AL-45 Westinghouse refrigerators to be installed in the Sovereign Hotel, local residential hotel.

Credit for the sale goes to A. L. Fridstein, apartment house manager; Albert I. Stadeker, apartment house supervisor; and Ray Kranz, apartment house salesman.

Eighty-three of the 85 refrigerators are installed within 48 hours of the order according to Fridstein.

## BARDWELL-ROBINSON BUYS DOWNING CO.

MINNEAPOLIS — Bardwell-Robinson of this city has purchased the Downing Display Refrigerator Co., and production is being carried on in the factory here, according to J. H. Coolidge of the Downing company.



# Don't get the price bear by the tail!

Who made any money this year on refrigerators? The industry dourly tells itself that nobody did. But the industry had gorged itself on two fat years when most other businesses were eating in the kitchen. And its idea of good business was biased.

There was money made this year. There will be good, substantial profits made in 1933.

But the industry should have learned by this time that while price is important it is only incidental. Is there any man (or woman, bless 'em) on the firing line who will admit that a difference of 10, 20, 30 dollars in the price of a *good* refrigerator would prevent his closing sales?

Plenty of the boys have the price bear by the tail. They can't hang on and they dash—let go. They've got themselves believing that only price will sell refrigerators. Then they find that price *doesn't* sell, yet they can't get back to a profitable basis.

That's the deceit of price. It looks so tame, but it goes berserk the moment you grab it.

Quality at a fair price, with good intelligent selling work, is still the way to substantial business and fair profits.

One of the elements of quality in an electric refrigerator is Dry-Zero insulation. It costs more than any other insulation but it gives much more than the cost in efficient, dependable, permanent service. Even so, the additional material cost for Dry-Zero in a cabinet as compared to the cheapest temporary substitute is but 3 to 6 cents per inside cubic foot of food capacity.

No matter how good a refrigerator may be, it will be better with Dry-Zero insulation. To interested executives Dry-Zero engineers will present comprehensive and acceptable proof of this statement.

Dry-Zero Corporation, Merchandise Mart, Chicago, Illinois.  
Canadian Office, 687 Broadview Avenue, Toronto.

THE MOST EFFICIENT  
COMMERCIAL INSULANT KNOWN **DRY-ZERO**



## Tentative List of Ex-Manufacturers of Household Electric Refrigerators

On this page are listed the names and addresses of manufacturers which—according to the best information we can obtain—have ceased active production and sale of household electric refrigerators.

To each name listed on this page (except those known to have been absorbed by other manufacturers) has gone a letter asking whether or not that concern is still manufacturing electric refrigerators. These letters have either been answered negatively, have not been answered at all, or have been returned unclaimed.

Obviously the list is not complete. Possibly it is not entirely correct. It will be revised at a later date, and probably will be included in the next edition of the REFRIGERATION DIRECTORY.

Readers of the NEWS are requested to furnish any corrective or qualifying information they may have on the above concerns, and to send in additional names of inactive companies for listing.

The editorial staff of the NEWS has been gathering and checking the names on the list presented herewith for the last several months. Chief sources have been H. R. Van Deventer and other industry "old-timers," letter-files of the ELECTRIC REFRIGERATION NEWS, public library periodical files, and a long list of friends in the industry, who have checked information concerning companies located in their various home cities and territories.—Editor.

### Companies Which Have Ceased Manufacturing Household Electric Refrigerators

American Ice Machine Co.  
212 N. Jackson, Glendale, Calif.  
American Refrigeration Co.  
816 S. Haskell Ave., Dallas, Texas  
(Div. of Booth Lumber & Loan Co.)  
American Refrigerator Co.  
(American Beauty refrigerator)  
Harris Bldg., Dayton, Ohio  
Arctic Ice Corp.  
854 McKnight Bldg.  
Minneapolis, Minn.  
Auto Electric Corp. (Blizzard)  
1532 N. 19th St., Milwaukee, Wis.  
Automatic Freezer Corp.  
1716 Ford Bldg., Detroit, Mich.  
Automatic Refrigerating Co.  
618 Capitol Ave., Hartford, Conn.  
Baldwin Refrigerator Co.  
Burlington, Vt.  
Berry Ice Machine Co.  
7344 Kercheval Ave., Detroit, Mich.  
Browning-Drake Electric Refrig. Co.  
West Townsend, Mass.  
Brunswick Refrigerating Co.  
New Brunswick, N. J.  
Bryant Electric Refrigerator Corp.  
New Milford, Pa.  
California Electric Refrigerators, Inc.  
5th & Dwight, Berkeley, Calif.  
Canton Refrigerators, Inc.  
250 W. 49th St., New York, N. Y.  
Calvert Electric Refrigeration Co.  
Woodberry, Baltimore, Md.  
Central Machine Co.  
1050 Mt. Elliott Ave., Detroit, Mich.  
Champion Shoe Machinery Co.  
3711 Forest Park Ave., St. Louis, Mo.  
Chicago Manufacturing Corp.  
307 N. Michigan Blvd., Chicago, Ill.  
Cleveland Iceless Cooler Co.  
971 East 63rd St., Cleveland, Ohio  
Cold Storage Refrigerator Co.  
Eau Claire, Wis.  
Colonial Mantel & Refrigerator Co.  
494 Dumont Ave., Brooklyn, N. Y.  
Commercial Auto Body Co.  
5401 N. Bulmer Ave., St. Louis, Mo.  
Common Sense Ice Machine Co.  
385 Dearborn, Chicago, Ill.  
Cooke Electrical Refrigeration Co.  
14-30 North Green St., Chicago, Ill.  
Deer Co., Inc., A. J.  
Buffalo & West Sts., Hornell, N. Y.  
Devon Manufacturing Co.  
2 Brooks St., Brighton, Mass.  
Dubois Refrigeration Co., Inc.  
133 E. 16th St., New York, N. Y.  
Eddy & Sons Co., D.  
336 Adams St., Dorchester, Mass.  
Electrofrust Corp.  
Naugatuck, Conn.  
Eskimo Refrigeration Co.  
914 Columbus Ave., Sandusky, Ohio  
Evercold Co., 210 E. 45th St.  
New York City  
Fairfield Manufacturing Co.  
Fidelity Bldg., Portland, Maine  
Fern-Glover Refrigerator Co.  
Linwood Rd. & Penn. R. R.  
Cincinnati, Ohio  
Fessler Mfg. Co. (Femcold)  
19th and Central, Kansas City, Mo.  
Freezel Corp., The  
483 Main St., Gardner, Mass.  
Freeze King Corp.  
2430 S. Michigan, Chicago, Ill.

Frigid Zone Manufacturing Co., Inc.  
2809 Third Ave., Seattle, Wash.  
Frigidor Corp.  
149 W. 36th St., New York, N. Y.  
Frostair Refrigerator Co.  
137 W. 44th St., New York, N. Y.  
General Refrigerating & Mfg. Corp.  
411 Kraemer Bldg., Portland, Ore.  
General Utilities Co.  
General Utilities Bldg.  
Bangor, Maine  
German American Ice Machine Co.  
c/o German-American Inventors & Industries Soc.  
55 W. 42nd St., New York, N. Y.  
"Germania" Refrigerator Co.  
Belleville, Illinois  
Goosmann Refrigeration Co.  
1225 Glenlake Ave., Chicago, Illinois  
Gobro Sheet Metal Mfg. Co.  
203 Julian Annex Bldg.  
Seattle, Wash.  
Hartford Engineering & Machine Co.  
Aberdeen, Md.  
Harris Ice Machine Works  
88 Tillamook, Portland, Ore.  
Hodapp & Son  
437 Carlisle Ave., Dayton, Ohio  
Holbrook Mfg. Co.  
6917 McKinley Ave.,  
Los Angeles, Calif.  
Hvid Ice Machine Corp.  
38 S. Dearborn St., Chicago, Ill.  
Iceaire Corp.  
Durand, Mich.  
Iceland Machine Corp.  
Babylon, N. Y.  
Icele Refrigerator Co.  
957 W. Main St., Los Angeles, Calif.  
Iroquois Electric Refrigeration Co.  
1600 Arch St., Philadelphia, Pa.  
Isko Co.  
2525 Clybourn Ave., Chicago, Illinois  
Jack Frost Refrigeration, Ltd.  
347 Sorauren Ave.  
Toronto, Ontario, Can.  
Karge Laboratories, Inc.  
Oswego, N. Y.  
Keystone Refrigerator Corp.  
Beaver Falls, Pa.  
Kozy-Kitch Kitchenet Co.  
La Grange, Ind.  
Lamson Co., Inc. (Ice Maid)  
Lamson St., Syracuse, N. Y.  
Lindsay, Hyde & Co.  
2130 E. York St., Philadelphia, Pa.  
Master Domestic Refrig. Co., Inc.  
27 Broadway, Flushing, N. Y.  
McCrary Refrigerator Co.  
Jacksonville, Fla.  
McCurdy Refrigerator Co.  
Ft. Madison, Iowa  
McKee Refrigerator Co.  
119 Lorimer St., Brooklyn, N. Y.  
Mechana-Kold Corp.  
Bay Shore, N. Y.  
Michigan Refrigeration Co., Inc.  
1600 Monroe Ave.  
Grand Rapids, Mich.  
Motorfrigerator Co.  
Lansdale, Pa.  
Narco Refrigerator Co.  
c/o F. W. Andrews  
Wapakoneta, Ohio  
National Electric Refrigeration Corp.  
304 Penn Ave., Scranton, Pa.

National Refrigerier Co.  
Greenville, Ohio  
North Star Refrigerator Co.  
Chattanooga, Tenn.  
Norwest Sales, Ltd.  
Granville Island, Vancouver, B. C.  
Oklahoma Radio Mfg. Corp.  
1644 E. 15th St., Tulsa, Okla.  
\*Parker Ice Machine Co.  
San Bernardino, Calif.  
\*Parker ice machine now being made  
by H. C. Parker, Ltd., 2726 Santa  
Fe Ave., Los Angeles, Calif.  
Phillips Refrigerator Co.  
393 Keele St., Toronto, Ontario, Can.  
Polaire Electric Refrigerator Co.  
1610 North St., Philadelphia, Pa.  
Polaris Electric Refrigerator Co.  
Logansport, Ind.  
Potter Refrigerator Corp.  
Ninth & Flanders Sts., Portland, Ore.  
Quality Products, Inc.  
Dayton Industrial Bldg., Dayton, O.  
Rauf Manufacturing Co.  
Bogota, N. J.  
Refrigeration Corp. of America, The  
10 High St., Boston, Mass.  
Refrigeration Engineering Co.  
(Coldmaker refrigerator)  
501 Toledo Factories Bldg.  
Toledo, Ohio  
Rome Manufacturing Co.  
Rome, N. Y.  
Romeson Mfg. Co.  
First National Bank Bldg.  
Pittsburgh, Pa.  
Rotax Co.  
380 E. 133rd St., New York, N. Y.  
Royal Refrigerator Co., Inc.  
281 Powell St., Brooklyn, N. Y.  
Sanat Refrigerating Co.  
331 Madison Ave., New York, N. Y.  
Sanitice Corp.  
60 E. 42d St., New York, N. Y.  
J. S. Refrigeration Division  
John Schroeder Lumber Co.  
952 Commerce St., Milwaukee, Wis.  
Schwenger-Klein Co.  
511 Woodland Ave., Cleveland, Ohio  
Simplex Refrigeration Co.  
Belleville, Illinois  
Socold Refrigerating Corp.  
19 Stewart St., Lynn, Mass.  
Steel Products Engineering Co.  
1060 W. Columbia, Springfield, Ohio  
Stroh Products Co.  
909 E. Elizabeth, Detroit, Mich.  
Superior Iceless Refrigeration Co.  
Canton, O., and Cleveland, O.  
Super Oil Heater Sales Co.  
613 Connecticut Blvd.  
E. Hartford, Conn.  
Triumph Ice Machine Co., The  
110-116 E. 70th St., Cincinnati, Ohio  
Universe Corp.  
400 W. Erie St., Chicago, Ill.  
Utility Products Co.  
Hillsdale, Mich.  
Ward Electric Refrigeration Co.  
2023 South Michigan Ave.  
Chicago, Ill., and Buchanan, Mich.  
Weir-Wheelock Co., Inc.  
56 Warren St., New York, N. Y.  
Wilde Co., W. B.  
Peoria, Ill.  
Williams Refrigeration Co.  
332 E. 95th St., New York, N. Y.  
Willie Co., H. F.  
Crawford, N. J.  
Wisconsin Refrigerator Co., Inc.  
Eau Claire, Wis.  
Edgar Wright Co.  
Brookfield, Mass.  
Zanesville Engineering Corp.  
Zanesville, Ohio  
Zero-Aire Corp.  
510 N. Dearborn St., Chicago, Illinois  
Zerovender, Inc.  
42 E. Pearson St., Chicago, Illinois

### Companies Said to Have Ceased Manufacturing And Which Cannot be Reached By Mail

A. M. C. Co., Butte, Mont.  
"Acme" Refrigerator Co., The  
New York, N. Y.  
American Engine & Airplane Co.  
Los Angeles, Calif.  
Anderson Co., A. P., Pittsburgh, Pa.  
Angeles Refrigeration Co.  
Los Angeles, Calif.  
Bachman Refrigerator Co.  
Pittsburgh, Pa.  
Balsa Refrigerator Corp.  
New York, N. Y.

Barsmith Refrigerator Co., Chicago, Ill.  
Bluebird Refrigerator Co.  
Long Beach, Calif.  
"Bosse" Refrigerator Co., The  
New York, N. Y.  
Brooks Refrigerator Co.  
Buffalo, N. Y.  
Cadillac Tool Co., Detroit, Mich.  
Cercold Refrigeration Co.  
Los Angeles, Calif.  
Chillo Manufacturing Co.  
Chicago, Illinois  
Clothel Refrigeration Co., The  
New York, N. Y.  
Cold Blast Refrigerator Co.  
New York, N. Y.  
Cold Unit Refrigerator Co.  
Chicago, Illinois  
Earnshaw Manufacturing Co.  
Philadelphia, Pa.  
Electric Refrigeration Co.  
Newark, N. J.  
Electrical Refrigerating Co.  
New York, N. Y.  
Frig-O-Matic, Ltd.  
Brantford, Ontario, Canada  
Frigor Refrigerator Co.  
Chicago, Illinois  
Frostmaker Refrigerator Co.  
Chicago, Illinois

Girard Co., A. O., Milwaukee, Wis.  
Hapgood Refrigerator Co.  
New York, N. Y.  
Hall Borchert Mfg. Co.  
Scranton, Pa.  
Jack Frost Refrigeration Co.  
Glendale, Calif.  
Keith Electric Corp.  
Toronto, Ontario, Canada  
Leonard Rotary Pump Corp.  
Los Angeles, Calif.  
Luitwieler, Samuel W.  
Los Angeles, Calif.  
McClellan Refrigerating Co.  
Chicago, Illinois  
Miller Hurst Corp., Detroit, Mich.  
Montclair Refrigerator Co.  
New York, N. Y.  
Penguin Refrigerator Co., Dubuque, Ia.  
Refrigo Corp., Milwaukee, Wis.  
Sorco Iceless Refrigerator Co.  
Sorco Mfg. Co., Scranton, Pa.  
Stacold Refrigerating Mfg. Co.  
Los Angeles, Calif.  
Trotter Refrigerator Co.  
Rochester, N. Y.  
Unit Refrigerating Co., Pittsburgh, Pa.  
Utility Compressor Co., Detroit, Mich.  
"Zicer" Refrigeration Co., The  
Cleveland, Ohio

### Electric Refrigeration Manufacturers Which Have Been Absorbed by Active Electric Refrigeration Manufacturers

COMPANY	ABSORBED BY
Absopure Refrigeration Corp.	Universal Cooler Corp.
1560 Theodore St., Detroit, Mich.	7424 Melville, Detroit, Mich.
Alaska Refrigerator Co.	Norge Corp.
Muskegon, Mich.	670 E. Woodbridge, Detroit, Mich.
American Electric Corp. (Electrice)	Belding Hall Electric Corp.
Belding, Mich.	in turn absorbed by:
	Gibson Electric Refrigerator Corp.
	Greenville, Mich.
American Foundry Equipment Co.	Summerheat Corp. of America
Mishawaka, Ind.	Dowagiac, Mich.
Armstrong Machinery Co., Inc.	General Machinery Co.
E. 3201-19 Riverside, Spokane, Wash.	3500 E. Riverside, Spokane, Wash.
Belding Hall Electric Corp.	Gibson Electric Refrigerator Corp.
Belding, Mich.	Greenville, Mich.
Benedict & Co., Ltd.	Starr Co.
1525 W. Seventh St.	Richmond, Ind.
Los Angeles, Calif.	
Climax Electrical Refrigeration Co.	Universal Cooler Corp.
Clinton, Iowa	(purch. refrigeration division)
	7424 Melville, Detroit, Mich.
Coldak Corp.	Metal Saw & Machine Co.
8 W. 40th St., New York, N. Y.	Springfield, Mass.
Electro-Kold Corp.	E. S. Matthews, Inc.
151 S. Post St., Spokane, Wash.	151 S. Post St., Spokane, Wash.
Everite Products, Inc.	Trupar Manufacturing Co.
200 Davis Ave., Dayton, Ohio	Dayton, Ohio
Excelsior Motor Mfg. & Supply Co.	Carbondale Machine Co.
3701 Cortland St., Chicago, Illinois	Carbondale, Pa.
Frankenburg Refrigeration Co.	Modern Refrigeration Co.
Belleville, Illinois	(change in name)
	later absorbed by:
	North Pole Corp.
	this year changed name to:
	Belleville Refrigeration Co.
General Necessities Corp.	Absopure Refrigeration Corp.
1560-78 Theodore St., Detroit, Mich.	1560 Theodore St., Detroit, Mich.
	later absorbed by:
	Universal Cooler Corp.
	7424 Melville, Detroit, Mich.
IcElect Corp.	Baker Ice Machine Co.
11th & Harney Sts., Omaha, Neb.	1518 Evans St., Omaha, Nebr.
Iron Mountain Co.	Zerozone Corp.
939-1011 E. 95th St., Chicago, Illinois	939 E. 95th St., Chicago, Illinois
Modern Refrigeration Co.	North Pole Corp.
Belleville, Illinois	Belleville, Illinois
	this year changed name to:
	Belleville Refrigeration Co.
National Electric Products Corp.	Servel, Inc.
Chicago, Illinois	51 E. 42nd St., New York, N. Y.
National Refrigerating Co.	Frigidaire Corp.
(Ice-O-Lator)	Dayton, Ohio
125 Munson St., New Haven, Conn.	
Nizer Corp.	Kelvinator Corp.
7424 Mackie St., Detroit, Mich.	14250 Plymouth Rd., Detroit, Mich.
North Pole Corp.	Belleville Refrigeration Co.
Belleville, Ill.	Belleville, Ill. (change in name)
Valley Electric Refrigerator Co.	Frigidaire Corp.
Dayton, Ohio	Dayton, Ohio
Wayne Home Equipment Co.	Apex Electrical Mfg. Co.
Ft. Wayne, Ind.	(purch. refrigeration division)
	1067 E. 152nd St., Cleveland
*Whitehead Refrigeration Co.	Kelvinator Corp.
58 Hamilton Rd., River Rouge, Mich.	14250 Plymouth Rd., Detroit, Mich.
or 58 Haltiner Rd., Detroit, Mich.	
*Whitehead and Kales still in business, refrigeration patents purchased by Kelvinator.	



# BUYER'S GUIDE

Manufacturers Specializing in Service  
to the Refrigeration Industry

**SPECIAL ADVERTISING RATE** (this column only)—\$12.00 per space. Payment is required monthly in advance to obtain this special low rate. Minimum Contract for this column—13 insertions in consecutive issues. All advertisements set in uniform style of type with standard border. Halftone engravings of 100-line screen, either outline or square finish. No reverse cuts or heavy black effects. No charge for composition.

## REQUESTS FOR INFORMATION

Please refer to the 1932 Refrigeration Directory and Market Data Book for a complete list of all manufacturers of refrigeration equipment, parts, materials, supplies, and accessories; also for all available statistical data on sales of refrigeration equipment, distribution methods, etc.

New edition with October Supplement (paper covers) is now available at \$1.00 per copy.

Advertisers will be given preference in published answers to requests for buyer's guide service, but a complete list of all known suppliers will be mailed if stamped, self-addressed envelope is enclosed with inquiry.

Readers who can be of assistance in furnishing correct answers to inquiries, or who can supply additional information, are invited to address Electric Refrigeration News, mentioning query number.

### Belding-Hall Electric

Query No. 1026—(New York) "Can you advise me if your magazine ever published articles describing the old Belding-Hall Electric refrigerator or where I might obtain technical information on the design and operation of this unit?"

Answer—Write Gibson Electric Refrigerator Corp., Greenville, Mich., which purchased the Belding-Hall Co.

### Refrigerator Drip Trays

Query No. 1027—(Radio company, New York City) "Kindly give us the names of manufacturers of refrigerator drip trays. We are interested in a quantity of these metal pans and would like to have the names of about a dozen manufacturers."

Answer—See page 340 of the 1932 REFRIGERATION DIRECTORY and MARKET DATA BOOK.

### List of Service Men

Query No. 1028—"Is there an available listing of refrigeration service men? If so where can we obtain such a list for the state of New Jersey?"

Answer—A list of independent service companies, classified by states, is being prepared and will be published in an early issue of ELECTRIC REFRIGERATION NEWS.

### Air Conditioning Export

Query No. 1029—(Foreign sales director, New York City)—"We would like to connect with an air-conditioning manufacturer who as yet has not grown into a national organization. Our interest would be to get into the export field with a company of limited means who is now starting in this business and with whom we may grow as their business grows."

## PHIL HARRISON MADE PRESIDENT OF LEAGUE

NEWARK—Philip H. Harrison, president of Philip H. Harrison & Co., General Electric distributor here, was recently elected president of the Essex Electrical League. He takes office Jan. 1, 1933.

Other officers of the league for the coming year are: John Caffrey, Jr., Buhl & Caffrey, electrical contractors, vice president; Edwin C. Butler, re-elected treasurer; and James H. Stapleton, Public Service Electric & Gas Co., re-elected secretary.

New members of the executive committee include: Frank J. Durkin, General Electric Supply Corp.; H. S. Stratton, Westinghouse Electric Supply Co., and Richard H. Osgood, Hazard Wire Co. Delegates to the New Jersey council of electrical leagues are Harold P. Litchfield, manager, Graybar Electric Co. and present president of the league, and Edward J. White.

At the November meeting of the Essex Electrical League Arthur E. Allen, vice president of the Westinghouse Lamp Co., was the guest speaker. He pointed out the fact that the General Electric Co. and the Westinghouse Lamp Co. are closed because of the competition of the Japanese bulb manufacturers.

"The American people will pay \$12,000,000 more this year for electric lights because they use imported Japanese electric light bulbs," said Mr. Allen. "It costs the Japanese fifty-eight hundredths of a cent to make a Christmas lamp, while the material for this same bulb costs the American manufacturer eight-tenths of a cent."

"The Japanese make flashlight lamps for four-tenths of a cent while the material for this product costs the American manufacturer six-tenths of a cent. A 60-watt lamp, according to lamp manufacturers, can be landed in New York City for two and one-eighth cents while the material costs the American manufacturers two and six-tenths cents."

"All this goes on in spite of a 20 per cent tariff," said Mr. Allen. "Because of these conditions 2,000 American workmen have been thrown out of jobs, and \$2,500,000 lost in wages."

## SEEGER CABINETS ORDERED FOR ARMY HOSPITAL

WASHINGTON, D. C.—An order for five 27-cu. ft. and two 44-cu. ft. Seeger all-porcelain, overhead-type commercial cabinets, equipped with Westinghouse refrigeration, to be installed in the Walter Reed General Hospital, U. S. Army, was recently secured by Edgar Morris Sales Co. here.

## THE CONDENSER

PAYMENT IN ADVANCE is required for advertising in this column. The following rates apply:

**POSITIONS WANTED**—Fifty words or less, one insertion \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each. **ALL OTHER CLASSIFICATIONS**—Fifty words or less, one insertion \$3.00, additional words six cents each. Three insertions \$8.00, additional words sixteen cents each.

REPLIES to advertisements with box numbers should be addressed to the box number in care of Electric Refrigeration News, 550 Maccabees Building, Detroit, Mich.

## SALES AGENCY WANTED

**SALES AGENCY WANTED.** Refrigerator Sales Engineer with thorough experience in construction, operation and selling in the commercial refrigerator show case line is interested in an agency for a high class refrigerator display case line, also commercial refrigeration, for states of New York and New Jersey. Box 530.

## 20 REX COLE SALESMEN NAMED JUNIOR DIRECTORS

NEW YORK CITY—Twenty salesmen recently achieved the position of junior sales directors in the 10 divisions of the retail department of Rex Cole, Inc., General Electric distributor here, according to Paul H. Hichborn, manager of the retail department.

This position was awarded the two highest salesmen in each division during the last two weeks of November. Each division has been divided into two teams, one for each of the junior sales directors, and during the month of December the teams will battle to secure the supremacy of their respective divisions.

At the end of the month, substantial cash prizes will be awarded to the leading teams, and the high man of the losing teams will receive \$25 for his efforts.

The names of the 10 divisions, and the men who will lead the 20 teams are as follows: Bay Ridge, Irving Gluck and A. Y. Tucker; Bond Street, Carl Schutten and D. Duynstee; Bronx, John Connelly and Otto Freitag.

Flatbush, Joseph Cormier and Samuel Gottesman; Flushing, William Urbach and Hans Omenitsch; Jamaica, Howard G. Paul and Elmer Van Name, Jr.; Long Island, Manuel Reina and Frank Seigmund; Manhattan, Martin Koenig and Eugene Doderer.

Queens Village, E. J. Blanchard and Mark Denton; Staten Island, Tom Wilson and Charles Reinhardt.

## SWOPE BECOMES MEMBER OF HONORARY FRATERNITY

BOSTON—Gerard Swope, president of the General Electric Co., well-known industrialist, and member of the corporation of the Massachusetts Institute of Technology, was initiated into Tau Beta Pi, national honorary engineering fraternity, by the Technology chapter of the fraternity last week.

Membership in Tau Beta Pi is nationally recognized as the highest honor attainable by a student in an engineering school.



## The PEERLESS THERMAL EXPANSION VALVE

(Pat. No. 1870990, Others Pending)

For use with Methyl Chloride and Sulphur Dioxide

The perfect thermostatic valve. The control always resides in the bulb due to the patented Peerless warming method. The PEERLESS will eliminate your expansion valve troubles.

List Price, \$13.50. Write for bulletin.

PEERLESS ICE MACHINE CO., 515 W. 35th St., Chicago, Ill.

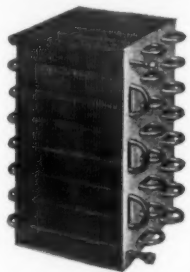
## A NEW FIN COIL by PEERLESS

Wedge-locked and edge-locked aluminum fins on tinned copper tubing for methyl chloride, sulphur dioxide, F-12, etc.—aluminum tubing for ammonia. Absolute Metal to Metal Contact.

A Superior Coil in which Soldered Return Bends have been eliminated.

Priced to meet 1932 conditions. Write—Wire for Catalog.

PEERLESS ICE MACHINE CO., 515 W. 35th St., Chicago, Ill.



Completely assembled and individually bagged. Ready for shipment in your refrigerator. Write for complete list of standard sizes and prices.

**Hoosier** Standardized Parts  
HOOSIER LAMP & STAMPING COMPANY, EVANSVILLE, IND.

## REFRIGERATION SUPPLIES

We carry a complete stock of  
EVERYTHING IN REFRIGERATION

including

"SUPERIOR" CARBON BRUSHES

Suitable for all types of fractional H.P. motors

MELCHIOR, ARMSTRONG, DESSAU CO.  
116 Broad St., New York 1135 Calowhill St., Philadelphia

## Do You Want Something Else to Sell?

Home owners are increasingly conscious of the advantages of clean, fresh air in kitchen, bath and other rooms of the house. There is a big market for MOTOVENT, the electric home ventilator. Fits any window—easy to install—beautiful in appearance.

Models to retail at 29.50 to 49.50. Attractive margins to distributors and dealers. Write for full details.

**MOTOVENT**

FRED'K N. ROSS, Inc. 1010 Beaubien St., Detroit

## BRING YOUR REFRIGERATION DIRECTORY UP TO DATE:

THE NEW 120-PAGE SUPPLEMENT to the 1932 Refrigeration Directory and Market Data Book, hitherto available only as a part of the Directory, can now be purchased SEPARATELY. It contains an analysis of current distribution trends; detailed specifications of 354 household models of 48 manufacturers; a month-by-month tabulation of sales during 1932; an air-conditioning directory; etc. Bound in green paper. 24c per copy. Payment in stamps acceptable. Write:

Business News Publishing Co., 550 Maccabees Bldg., Detroit

## COMBINATION SUBSCRIPTION RATES

How to save money on your subscription order

NO.	PUBLICATIONS	YOU PAY	YOU SAVE
1	Electric Refrigeration News (1 Year) and Refrigeration Directory and Market Data Book*	\$3.50	\$ .50
2	Electric Refrigeration News (2 Years) and Refrigeration Directory and Market Data Book*	\$5.50	\$1.50
3	Refrigerated Food News (1 Year) and Refrigeration Directory and Market Data Book*	\$1.50	\$ .50
4	Refrigerated Food News (1 Year) and Electric Refrigeration News (1 Year)	\$3.50	\$ .50
5	Refrigeration Directory and Market Data Book* and Electric Refrigeration News (1 Year) and Refrigerated Food News (1 Year)	\$4.00	\$1.00
6	Refrigeration Directory and Market Data Book* and Electric Refrigeration News (17 Weeks)	\$1.50	\$ .50

Order by number. Use coupon below. These rates for U. S. only.  
\*New edition, with paper cover, including Supplement.

## Export of Refrigerators

October, 1932, Shipments Reported by the Bureau of Foreign and Domestic Commerce, Washington, D. C.

	Electric Household Refrigerators	Electric Commercial Refrigerators	Parts for Electric Refrigerators
	Number	Value	Value
Austria	24	\$ 849	\$ 777
Belgium	52	4,432	1,444
Bulgaria	7	700	431
Denmark	105	6,407	12,007
France	22	1,305	1,270
Germany	...	...	400
Gibraltar	...	...	49
Irish Free State	1	150	238
Italy	38	2,200	3,160
Netherlands	...	...	425
Norway	...	...	70
Poland and Danzig	1	376	62
Portugal	49	3,777	1,767
Spain	28	1,730	485
Sweden	4	351	3,038
Switzerland	225	11,371	13,714
United Kingdom	55	3,742	8,467
Canada	1	127	...
British Honduras	2	191	...
Costa Rica	1	190	...
Guatemala	3	527	82
Honduras	...	...	53
Nicaragua	21	3,388	489
Panama	4	434	...
Salvador	16	1,056	679
Mexico	3	298	182
Bermudas	10	984	20
Barbados	5	1,301	541
Jamaica	2	273	194
Trinidad and Tobago	4	349	117
Other British West Indies	10	867	746
Cuba	18	1,999	339
Dominican Republic	6	548	194
Netherland West Indies	6	771	89
Haiti, Republic of	494	32,066	8,870
Virgin Islands of U. S.	189	18,690	122
Argentina	3	196	174
Brazil	4	293	89
Chile	...	...	28
Colombia	16	2,010	207
Ecuador	17	1,092	1,130
Peru	18	1,658	210
Uruguay	4	535	...
Venezuela	57	4,777	1,436
Aden	31	3,195	815
British India	16	269	280
British Malaya	54	5,908	1,443
Ceylon	75	9,392	1,233
China	...	...	40
Netherland East Indies	17	2,135	250
French Indo-China	8	912	1,183
Hong Kong	1	120	10
Japan	41	3,230	526
Kwantung	2	300	105
Palestine	...	...	3,412
Philippine Islands	17	1,202	137
Turkey	...	...	887
Australia	1,104	113,204	226
French Oceania	13	1,280	4,768
New Zealand	...	...	281
British East Africa	...	...	243
Union of South Africa	...	...	32
Other British South Africa	...	...	26
Gold Coast	...	...	148
Nigeria	...	...	243
Other British West Africa	...	...	931
Egypt	...	...	14
Algeria and Tunisia	...	...	...
Other French Africa	...	...	...
Morocco	...	...	...
Mozambique	...	...	...
Canary Islands	...	...	...
<b>Total</b>	<b>2,936</b>	<b>\$258,095</b>	<b>657</b>
Shipments to Hawaii	354	\$ 29,432	12
Porto Rico	32	\$ 4,893	61
			<b>\$111,048</b>
			<b>\$ 82,110</b>
			<b>\$ 9,121</b>
			<b>\$ 1,600</b>

## McCORD REFRIGERATION PRODUCTS

Commercial Evaporators

Domestic Evaporators

Condensers

Easy-Out Ice Trays

Spiral Finned Tubing

Spiral Copper Finned Iron,  
Steel or Copper Pipe

McCORD  
RADIATOR &  
MFG. CO.

DETROIT, MICH.



# LITTLE STORIES OF INTERESTING PEOPLE IN THE REFRIGERATION INDUSTRY

# THE EXPANSION VALVE

# LITTLE STORIES OF INTERESTING IDEAS IN THE REFRIGERATION INDUSTRY

By George F. Taubeneck

## Object Lesson in re Price Cutting

Salesmanship can beat price. We saw a corking good object lesson which pointed that moral a short time ago in New York City.

Down on Eighth Ave. near 37th St. (not far from the Hotel New Yorker) there are two hot doggeries side-by-side.

Now these dispensaries of America's national fruit are no ordinary hole-in-the-wall stands. They are lengthy lunchrooms, with long bars (milk and coffee only), chairs and tables, and open fronts—like they have down South.

One of these wiener emporiums cut the price of hot dogs from five cents to three cents. The other proprietor stood his ground.

At first the price-cutter got some extra business.

The standpat proprietor didn't put up with that situation for long, however.

He owns a train-caller's voice and a medicine show spieler's line. Wisely, he put them both to work.

Whenever the stream of passersby begins to thicken, he commences his harangue. It's a good-natured harangue, but not sparing. It's what some of our readers might call "unethical."

He lifts a banana-cluster bunch of his own wieners, and calls attention to their pristine beauty, their wholesome nature. Then he derides the quality of his next-door competitor's wieners in scathing terms—daring his audience to buy one of each and compare the two.

"Sure," he cries, "save your two cents and then pay a doctor ten dollars."

His competitor, he avers in a lowered voice, will soon be going out of business and is "dumping distress merchandise."

Result: he draws a crowd, and the crowd flows in. The price-cutter's trade became almost negligible.

Just before the Valve left New York City, the price-cutter bethought himself of an answer.

He hired a girl—a pippin, too, one of these buxom, rosy-cheeked, wind-blown, heavy-tressed, dancing eyes gals who makes you feel 10 years younger. After looking all week at New York showgirls and other perfectly turned-out specimens of the exterior decorators' art (don't get us wrong—we like to look at 'em, same as you) this vigorous lass was a treat, indeed.

She had a harangue, too. "Look at me!" she exulted (and we all did look at her). "Do I feel great! Am I happy! Am I healthy! I live on these hot dogs! Come on in where it's warmer, and try one yourself!"

She gets some trade. But the next door spieler, selling a higher-priced product, still gets the bulk of the business.

Salesmanship, in this little demonstration, licked both Price and Sex—than which there are few more potent appeals.

## 'Little House'

While in New York we dropped in at the store of W. & J. Sloane to see the "Little House" on display there—a full sized house built under the direction of *House and Garden* to give its readers an idea of what they should have in a modern home, and what they should spend for it.

This little house is a creation of 1932. It is American. It is built to meet the requirements of contemporary living. It is not a mass of lines and motifs in vogue 50 or 200 years ago.

Cost of the house is said to be about \$5,000. The furnishings cost \$2,000, and the garden \$750. Howard & Frenaye, architects, designed the house, and W. & J. Sloane furnished it.

In size and furnishings, the little structure is supposed to be the answer to the problems of young people building their first home, or to older persons who want to enjoy "Simplified Living."

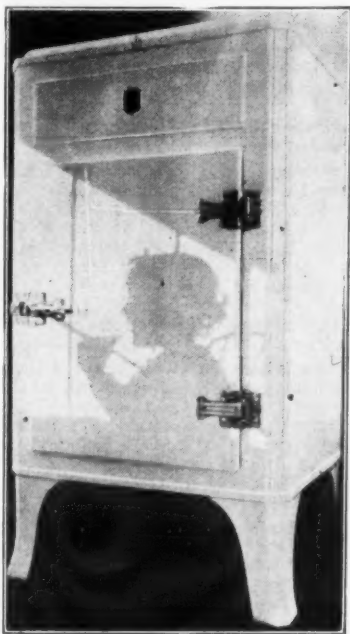
The house can be built on a plot of ground 75 by 100 feet in size, and is a one-story structure. At the front and rear of the house is a large Palladian window set in an advanced bay.

Brick porches flank this window in the front. At the rear, a French door leading to the terrace is the middle member of the window. Outside of the house is made of treated shingles, with a shingle roof.

Living and dining rooms are combined in the model home. Ceiling of this room is rounded, and at one side of the room is a fireplace. The black floor catches one's eye. There is just one chimney in the house, that for the furnace and fireplace. (Perhaps you can guess why there's no chimney in the kitchen.)

On one side of the living room are two bedrooms and a bathroom. On the other side are a study or servant's

## Shadow



This is the first picture of a refrigerator cabinet unembellished by people to appear in this sheet since the Valve has had the tag of editor. But don't you think this shadow treatment of the new Majestic deserves special notice?

room, the kitchen, and another bathroom. Bedrooms are aglow with color. In one is an old-fashioned four-poster bed.

*House & Garden* maintains that its model home embodies all features which a good, modern home should possess: It has definite character and is suitable to its site and neighborhood (two of the houses have already been erected in New York suburbs).

Its equipment and construction materials are products in which the consuming public has confidence and which have been advertised widely during a period of years.

Incidentally, the "Little House" is equipped with a complete General Electric kitchen.

So, too, is the "Wonder House" built within the John Wanamaker store in New York City.

For both model homes the all-electric kitchen is said to attract more attention than any other feature of the house.

## Sales Resistance

In a recent issue of the *Saturday Evening Post*, the following paragraph caught our eye and made us laugh:

"A banquet is an affair where you eat a lot of food you don't want before talking about something you don't understand to a crowd of people who don't want to hear you."

Encouraged, we looked at the rest of the page, and found this bit of verse by a rhymester who is evidently left cold by the appeal of air conditioning:

### WINDOWS

(The House of the Future, according to modern architects, will make its own climate, and the windows will not open.)

Your future windows-panes may get

The rays of ultra-violet,

And filtered air

May enter where

It's piped in from the basement;

But hygienic though this be,

You needn't build a house for me

With windows glassed

So tight and fast

They're solid in their casement.

Fixed windows make a prison wall

Through which we couldn't lean

or call

To friends who pass,

But, jailed in glass

With no gross dirt to grime it,

We'd bar the breeze with microbes rife

And lead a safe aseptic life.

Each house a cell

Where we would dwell,

Breathing our private climate.

I wouldn't care for that. Would you?

Windows were made to "Yoo-hoo" through,

They're meant to bring

The breath of spring

Within our habitation.

They're meant, at whiles, to open wide,

Admitting from the world outside

Life's hum and roar.

Windows are more

Than merely ventilation.

The modernistic architect

May tell us that we may expect

Windows that stay

By night and day

As tight as they can make 'em,

But if I'm forced to live where I

Can never raise the windows high

In my abode,

Science be blowed!

I'll toss a brick and break 'em!

—BERTON BRALEY.

## Will Durant

Will Durant, popular philosopher and author of the best-selling "Story of Philosophy," was in Detroit the other day. We heard him drop a few Remarkable Remarks which, just for the fun of it, we'd like to pass along. *Nota bene:*

"The greatest discovery of a man's life comes when he learns that nothing is certain, that the greatest problems are never solved."

"Bernard Shaw avers that anyone is a heretic who understands anything. But anyone intelligent enough to understand anything thoroughly knows that his heresy differs so slightly from orthodoxy on the subject he understands that it isn't worth fighting about."

"The function of government is to increase, not decrease, liberty. Every law should be judged by this criterion: Does it add to our freedom?"

"Most discouraging thing about the

scheme of the universe is the indiscriminateness of disease, accident, and death. Germs can't read philosophy or understand science, and they don't know a good man when they see one."

"If one could live in poverty, one could write honestly; but if one has \$1,000, one must think of what one is saying. I can assure you that it is very difficult to write honestly for 50 cents per word!"

## Resourcefulness

Readers often ask us "how on earth" we manage to dig up so much unexpected news. Whereupon we smile knowingly and indicate with a trick eyebrow that at our service is a vast network of underground communication channels.

As a matter of fact, our scoops (latest big scoop: complete details of the new Grunow refrigerator a month before its public announcement, and previous to any other trade press stories) result from a combination of sheer luck, perseverance, a legion of good friends, and an enterprising staff spirit.

For an example of the latter, the bring-home-the-bacon resourcefulness of the Valve's youthful cohorts, we'd like to present the case of Elston Herron, staff writer.

Some time ago the Valve picked up a hint that Continental Motors is planning to market its new low-priced automobile lines "direct to the consumer." We smelled a story. If Continental had a new merchandising scheme for automobiles, perhaps it might give refrigeration men an idea.

So we assigned Herron to go out and interview FRED ROCKELMAN, who

was formerly in charge of Plymouth sales, and who now holds the same job at Continental. Herron, a relative newcomer to Detroit, had never heard of Rockelman. Rockelman had undoubtedly never heard of Herron. But Herron got an appointment just the same.

Arriving at the Continental offices on East Jefferson late in the afternoon he found all doors locked. Did he decide to call it a day and go home to a warm apartment and a steaming dinner? He did not! He walked to a nearby filling station, and phoned the Continental offices.

"I want to see Mr. Rockelman, but your doors are locked and I can't get in," he said.

"Everybody's gone home, and we can't let anyone in," snapped a rather peevish girl's voice at the other end of the line.

"But I have an appointment with Mr. Rockelman."

"Too bad, but he ain't in."

Did Herron give up? Not on your life! He waited a moment, and phoned Continental right back. This time, in a disguised bass voice, he made a preemptory demand to speak to Mr. Rockelman.

"Who's calling, please?"

"Just tell him Herron is on the wire."

Impressed, the switchboard girl put the call through. Mr. Rockelman himself came down to unlock the door and let reporter Herron in for his interview.

# PRICES and DISCOUNTS that Insure your 1933 PROFITS!

FACE the facts, Mr. Dealer. You should make money on electric refrigerators in 1933. How are you going to do it?

You know that you can't make much selling short-profit refrigerators. For no matter how many you sell, your dollar profit will be hopelessly small.

Nor can you do it selling refrigerators that are out of line on price—not in this day of alert buying.

Nor can you do it with cheap, flimsy refrigerators that can never hope to give satisfaction.

No sir! You've got to have a bang-up, quality line—priced right—with discounts that insure a worthwhile profit.

No other refrigerator in the world can compare with the Mayflower in

these respects. Here is a refrigerator with discounts that insure you a handsome profit on each sale.

A refrigerator that is priced at popular competitive prices.

A refrigerator backed by a company with a 12-year record of success, that is unsurpassed for economical operation and trouble-free service.

Mayflower offers you a new line embodying improvements with discounts that mean big profits in 1933.

Don't take our word for it. Get the facts. Write, wire or phone today for full information on the new 1933 Mayflower line.

TRUPAR MANUFACTURING COMPANY  
Dayton Ohio



# MAYFLOWER

## ELECTRIC REFRIGERATION



WRITTEN TO BE READ  
ON ARRIVAL

## Engineering Section

IN TWO PARTS  
PART TWO

# ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office

The business newspaper of the refrigeration industry

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THREE DOLLARS PER YEAR

## Wood Conversion Uses New Process for Forming Slabs

### New Production Method Will Effect Lower Shipping Cost

CHICAGO—To reduce freight costs on refrigerator insulation, the Wood Conversion Co. has announced a new process for producing sealed slabs of insulation in refrigerator manufacturers' factories.

Under the new plan, "H-F" pulp of the Wood Conversion Co. will be compressed into bales of high density, shipped in that form to refrigerator manufacturers, where the bales will be "fluffed out" and insulation slabs formed in a processing machine which has just been designed.

By shipping compressed pulp instead of formed slabs (which take up considerably more space in a freight car), substantial savings can be effected in the overall cost of insulation to the refrigerator manufacturer, D. H. Corlette, industrial sales manager, points out.

This same insulating material has been used by several manufacturers of refrigerators for about six years, Mr. Corlette says, estimating that 250,000 cabinets are now in service with Balsam-Wool.

As a rule the most effective insulating materials are those having the least density, but unfortunately freight costs on extremely light sealed slab insulation are high, he explains. "However, with this new system, the unfinished insulating material is compressed into hard bales by hydraulic pressure, and can be shipped at a low freight cost because of the increased amount of material which can be loaded into a freight car," he states.

"A full 40,000 lbs. of the compressed insulation can be loaded in a car. This amount is convertible into approximately 100,000 board feet of insulation—over three times the volume previously possible," he claims. One carload of H-F pulp should provide material to make Balsam-Wool fiber slabs for 1,800 to 2,500 complete refrigerators in the 5-cu. ft. range, Wood Conversion engineers estimate.

The bale-breaking and slab-forming equipment is furnished to the refrigerator manufacturer by the Wood Conversion Co. on a rental basis. It is estimated that one set of machinery will produce sets of slabs for 400 cabinets in 10 hours, or approximately 8,000 sq. ft. of insulation surface.

The process requires 3½ operators, one of four workers being free for ½-time duty on other work.

Mr. Corlette describes the new slab-forming process as follows: After the baled fibers are "fluffed," they are transported to a hopper over the forming machine where they are compressed

(Concluded on Page 3, Column 1)

## A.S.R.E. TO COOPERATE IN FAIR'S 'ENGINEERING WEEK'

CHICAGO—The week of June 25-30, 1933, has been designated as "Engineering Week" in connection with the Century of Progress Exposition to be held here, according to World Fair officials. One day will be known as "Engineers' Day."

Nineteen engineering associations, including the American Society of Refrigerating Engineers and the National Association of Practical Refrigerating Engineers, will take part. Well-known engineers will appear on the programs, according to the plans being formulated now.

It is expected that the various societies will hold individual or joint meetings during the week, and then on "Engineers' Day" all groups will join in a large conference.

## Lewis-Shepard Builds Drum Storage Lifts

BOSTON—Lewis-Shepard Co. here, is manufacturing a line of skid platforms and barrel racks for storage of refrigerator drums and containers, and a line of drum stackers and jacks.

The company's jacklift is so constructed that workmen can slide the device under the base of a skid platform, raise the platform from the floor, and transport it and the drum to any desired place.

## 15 Units Installed In 5 Hours

WOODMERE, L. I.—Five hours after their arrival from the factory in Detroit, 15 Kelvinator electric refrigerators were installed and making ice in one of Woodmere's leading apartment buildings.

The installation was made by B. R. Sharpe, dealer at Woodmere. A banking syndicate which controls the property purchased the refrigerators and installed them without notice to the tenants, according to Dealer Sharpe.

## YORK EQUIPMENT TO COOL GOVT. BUILDINGS

YORK, Pa.—S. E. Lauer, general sales manager of the York Ice Machinery Corp., announces that orders have just been received for the refrigerating equipment to be used in air conditioning the new U. S. Department of Justice building and also for the new U. S. Post Office building in Washington, D. C.

Mr. Lauer claims that the refrigerating system which is to be installed in the Department of Justice building for cooling and dehumidifying the air will represent the largest single installation of refrigerating equipment for air conditioning under one roof in the world.

During the summer, the refrigeration effect provided by this system will be equivalent to the melting of 2,000 tons of ice every 24 hours. To provide this amount of refrigeration, three large Freon (F-12) compressors are to be installed.

The building, already under construction and scheduled for occupancy on or before July, 1934, is seven stories high, will contain approximately 1,500 rooms, and will be air conditioned throughout. It is expected that nearly 3,000 people will occupy the completed structure.

According to the general contractor's schedule, the brick and stone work of the building will be completed around June, 1933. Installation of the refrigeration and air-conditioning equipment as well as other mechanical and electrical equipment will be started within a few months, as soon as building conditions permit, and completed by this time next year.

In the new U. S. Post Office building in Washington, D. C., the refrigeration and air-conditioning system will provide indoor weather for the 2,400 employees who will occupy the building in 1934.

Eight floors of this building, the cafeteria in the basement and the corridors, totalling a space of approximately 1,000 rooms, will be air conditioned for all-year-round comfort.

In summer, when temperatures of

(Concluded on Page 3, Column 4)

## HARTFORD CONCERN BUILDS NEW DEFROSTING SWITCH

HARTFORD, Conn.—M. H. Rhodes, Inc., has developed a new switch designed for use as a semi-automatic defrosting device for household electric refrigerators, and as a timer for quick freezing in household units, according to G. K. Thompson, sales manager.

Two arrow indicators are used in operating the new switch. By setting one to "defrost," and the other to any number of hours from one to five, the defrosting process is started.

Motor remains off for the number of hours indicated, and then starts operating again.

For quick freezing, one arrow is set at "quick freezing," and the other to the proper number of hours. The time indicator cuts out the unit's thermostat and keeps the refrigerator at a low temperature until the number of hours indicated has elapsed.

According to Mr. Thompson, the system comprises an ordinary single pole double-throw snap switch on the right, and a special Mark Time defrosting switch on the left. The switch is dust-proof and moisture-proof. It is suitable for handling current loads as high as 20 amperes at 125 volts, A. C. or D. C.

## JUDGE DECLARES DU PONT LACQUER PATENT INVALID

### Decision Halts Attempt to Stabilize Lacquer Industry

NEW YORK CITY—E. I. du Pont de Nemour Co.'s project to bring about stabilization of the lacquer producing industry by licensing certain manufacturers under du Pont's patents on low viscosity nitrocellulose lacquer was stopped two weeks ago in the U. S. district court of Eastern New York when Judge Marcus B. Campbell handed down a decision which ruled the du Pont patent invalid.

Defendant in the suit was the Glidden Co., lacquer manufacturer of Cleveland, which had refused to accept the du Pont license which was offered in April, 1931. In June, 1931, the du Pont company brought suit in equity No. 5,544 against Glidden, claiming infringement of patent No. reissue 16,803 (issued to E. M. Flaherty on Nov. 29, 1927) and patent No. 1,710,453 (issued to Maurice Hitt on April 23, 1929).

Early in October, 1931, the du Pont organization brought a second suit on the same patents, against the Jones-Dabney Co., Wilmington, Del., which had also refused to agree to a license.

The du Pont company first proposed its plan of using license contracts under its lacquer patents as a means of stabilizing the lacquer industry in a general meeting of lacquer manufacturers on Oct. 14 in Toronto. This meeting was held under the auspices of the Lacquer Institute, and was attended by all major lacquer manufacturers.

A license contract was subsequently prepared, and offered to a number of manufacturers in February, 1931. Under terms of the license, du Pont was to

(Continued from Page 7, Column 1)

## SMALL ROTARY LINE DESIGNED BY VILTER

MILWAUKEE—Vilter Mfg. Co. here has introduced a new line of small rotary compressors for commercial work, ranging in size from ¼ to 5 hp.

The new compressors are designed along the same general lines as Vilter's rotary compressors for booster service introduced a year and a half ago, according to Robert S. Wheaton of the sales department.

Adaptable for use with ammonia, methyl chloride, or F-12, the new machines are built as self-contained direct-connected units of both the water-cooled and air-cooled types.

No foundation is required for either type, says Mr. Wheaton, as each unit is so constructed and balanced that a level floor suffices as a base for the units.

All units are fitted with suction check valves which prevent the refrigerant in the high-pressure side from finding its way into the low-pressure side, and condensing there when the machines are not operating.

The water-cooled unit is fitted with an automatic water control valve which allows the cooling water to flow through the condenser when a predetermined discharge pressure has been obtained while the machine is in operation.

In the larger sizes of the new line, lubrication and cooling of the compressor are effected by a pressure pump, while in all other models oil is circulated through an oil cooler partly by thermostatic action and partly by a simple circulation arrangement.

Refrigerating capacities of the new compressors are shown in the table on page eight.

## Austin Jones Joins Wurlitzer Co.

CINCINNATI—Austin Jones, former service manager for the Fink Electric Refrigeration Co., Copeland distributor here, has joined the Rudolph Wurlitzer Co. as superintendent of engineering and installation. Working under Rembert W. Wurlitzer, vice president in charge of commercial refrigeration, Mr. Jones will direct the installation of All-American Mohawk household, commercial, and air-conditioning equipment.

## Speakers from Four Branches Of Industry Discuss Outlook

### Service Men Take Sales Course

HAGERSTOWN, Md.—Service men of Kelvinator-Boman, Inc., Kelvinator distributor here, will be fully-equipped salesmen, too, if A. H. Warne, secretary and treasurer of the company, has his way.

He has ordered from the factory in Detroit a subscription to "Sales Slants," monthly text-book on the selling of Kelvinator refrigerators, for each service man in the organization.

"Studying of this booklet will not only equip service men to talk more intelligently with users, but it will also enable them to bring in more prospects," he said. "This move will also create greater cooperation between sales and service, working to the advantage of all concerned."

## VANCOTT DISCUSSES EVAPORATOR LOADS

LOS ANGELES—"Evaporator Capacity, and Its Relation to Machine Capacity with Sulphur Dioxide and Methyl Chloride" was discussed by B. R. Vancott of the Bedell Engineering Co. at the last meeting of the Los Angeles Section, A.S.R.E.

The speaker requested that questions be asked as the talk progressed rather than at its conclusion, so lively discussion developed on several different points.

"People like to see frost on coils," he said, "but actually ½ in. of frost lowers the efficiency about 20 per cent. To freeze ice on coils requires the absorption of 970 B.t.u. per lb. for latent heat of condensation plus 144 B.t.u. per lb. for latent heat of freezing, plus the heat removed to drop the ice to coil temperature. This refrigerating effect is entirely lost until the coil is defrosted and even then only the last two can be recovered."

"To increase both coil and compressor efficiency, cross-fin expansion coils have been developed, in various types. One of the original cross-fin coils used aluminum fins, and was designed for 100 per cent surface, that is, coil surface equal to 100 per cent of the exterior box surface. Later, copper was used for the fins, manufacturers of these coils claiming that ¼ less coil area was required because of the increased conductivity of copper."

"The point I want to make here, is that this question of conductivity doesn't enter into the problem when fins don't extend over 1 in. from the tube. In the flow of heat from the food or product to the air, from the air to the fins and then through the fins to the refrigerant, the slowest parts of the cycle are the transfer from product to air and from air to fins. This is so slow that almost any type of fin would be satisfactory. The accepted size of fin is 5¼x6 in., spaced 1 in. apart and using four tubes," he said.

One of the audience then asked the

(Concluded on Page 3, Column 2)

## HOAG ELECTED HEAD OF DRY-ZERO FOREMAN'S CLUB

CHICAGO—R. W. Hoag was elected president of the Dry-Zero Foreman's Club, organization of Dry-Zero factory employees. C. Arndt was chosen vice president; W. Olson, treasurer; and F. Levic, secretary.

Members of the finance committee of the club include: N. Easter, W. Hodina, R. Oberhofer, S. Reponen, and E. Sorenson. The educational committee is made up of: W. W. Allen, M. Goodheart, and R. Oberhofer.

On the entertainment committee are C. Anthews, S. G. Davis, W. Dunn, N. Easter, and W. Hodina, while the sick committee is composed of C. Holle, L. Marquardt, and K. Stanek.

M. Schultz was elected librarian of the club for the coming year, while the following were named on the commissary committee: C. Davis, W. Dunn, M. Gotto, S. Reponen, and E. Sorenson.

The Spokesman staff is made up of the following: G. Benson, T. Braden, J. K. Cornell, F. Levic, D. Meister, and E. Sorenson.

## 80 Detroit Engineers Hear Speakers at First Meeting

DETROIT—Good prospects for four branches of the refrigeration industry were foreseen by four speakers before the Detroit Section, American Society of Refrigerating Engineers, Monday night, Dec. 19, in a meeting that was devoted to the "Outlook for 1933." Approximately 80 attended the meeting, first of the season, which was held in the Book-Cadillac Hotel.

Major Howard Blood, president of Norge Corp., spoke on household refrigeration; G. M. Johnston, president of Universal Cooler Corp., treated commercial refrigeration; while A. G. Loeffel, Detroit City Service Co., spoke on ice refrigeration; and A. C. Schubring, Michigan Alkali Co., talked on solid CO<sub>2</sub> refrigeration.

"Don't get into a rut!" Mr. Blood warned the engineers. "You can't afford to be satisfied with your past accomplishments."

To illustrate his point, Mr. Blood cited his own experience with the manufacture of automobile transmissions. Some 10 years ago, when he was connected with the Detroit Gear & Machine Co., engineers had concluded that the design of gears for automobile transmission had become standardized, and that the problem to be solved was one of quantity production—to make the cost such that the automobile manufacturer would not find it economical to make his own.

"Look what has happened to automobile transmissions since that time," Mr. Blood exclaimed. "Not only were new and better gears designed, but in the last few years we have had such revolutionary developments as synchro-mesh transmissions, free wheeling, and the automatic clutch. Now men in this field won't attempt to predict what the developments in the next few years may be."

As an executive of the refrigeration industry, Mr. Blood challenged the engineers to design refrigerators that are more efficient in operation, more beautiful in appearance, and which create better conditions for the preservation of food.

"You ought to be putting new ideas into refrigerator construction at a rate that would force the small, price-cutting assembler to drop out of the race," the speaker said.

Mr. Blood lashed the tendency of sales departments to emphasize price as a selling appeal. "The electric refrigeration industry should return to its original sales idea—that domestic refrigeration is a 10-year job of preserving food in the home."

"We should again base our sales ap-

(Concluded on Page 2, Column 1)

## GOODRICH CHEMIST TO BE AWARDED PERKIN MEDAL

NEW YORK CITY—George Oenslager of the B. F. Goodrich Co., will be presented the Perkin Medal at a meeting of the American Section of the Society of Chemical Industry and other cooperating societies, to be held on Jan. 6 in the Electrical Institute Auditorium, Grand Central Palace, here.

The award has been made for Mr. Oenslager's contributions to the rubber industry. He is to present an address describing the development of organic accelerators for rubber vulcanization.

Alfred P. Jones of the Houston Properties Corp. will describe the work and accomplishments of Mr. Oenslager that have led to the award. Prof. Marston T. Bogert, past president of the Society of Chemical Industry, will make the presentation.

## Dumore Co. Brings Out Portable Humidifier

RACINE, Wis.—Dumore Co. here, has introduced a new portable electric humidifier which will retail for \$19.50. It is adaptable for use as a heating and cooling unit also, according to H. E. Wilson, Dumore general manager.

The humidifier is equipped with a Dumore motor, and can be operated on either A. C. or D. C. Under test, the new unit increased the humidity in an average sized room by 60 per cent.



## Blood, Johnston, Schubring & Loeffel Address Detroit Engineers

(Concluded from Page 1, Column 5)  
peal on what refrigeration will do for the user. You as engineers should exert your influence to guide the sales department in making the correct and effective sales appeal.

"You should also be building refrigerators that maintain better temperatures and air conditions so that a sales story can be built around the job that the electric refrigerator will do in the home."

### Loeffel Speaks on Ice

Mr. Loeffel, at the beginning of his talk, announced that he would hold up the ice industry before a "mirror," and that he would give a verbal description of the reflected image.

He described the present situation of the ice industry, and its future possibilities, from the standpoint of the product, service, and the ice refrigerator cabinet.

"It cannot be denied that ice of sufficient surface will furnish refrigeration for the preservation of foods," Loeffel stated. "I might also add that the air which is cooled by passing over the ice picks up enough humidity to keep the food from dehydrating, a condition which is not always true in the mechanical refrigerator."

He referred several times to the "desiccating" action of electric refrigerators on their contents.

"In the matter of service, the ice industry has advanced a long way from the 'take it or leave it' attitude that was common when the ice interests had a monopoly in the refrigeration field. Today the ice companies are offering prompt, courteous service."

### Improvement in Construction

"In the matter of the construction of ice refrigerators, there is still room for improvement," Mr. Loeffel declared. "Because the first manufacturers of such equipment built the ice chamber in the top of the cabinet, this manner of construction has been followed right through to the present time."

"There was apparently some reason for doing this, but there are also many disadvantages, especially in commercial coolers. The iceman often faces the danger of injury when servicing such a cooler, or of damaging the store fixtures. Also, the ice compartment is sometimes very near the ceiling, the hottest part of the store."

The speaker took the electric refrigeration industry to task for what he termed the "mis-selling" the public on the dangers of the 50° F. refrigeration furnished by ice, and for the misrepresentations made by salesmen and advertising copywriters concerning the "bacteria-producing qualities" of the ice box drain.

"The electric refrigeration industry should realize that the ice industry laid the foundation for the acceptance of refrigeration by the public," Mr. Loeffel said. "If we have done nothing else, we can offer you the fact that every home equipped with an icebox is a better prospect for electric refrigeration than one without an icebox."

The ice industry, the speaker pointed

out, has altered the shortsighted merchandising policy to which it has adhered until recently, and will make a very definite effort to get its share of the business in 1933.

In closing, Mr. Loeffel hinted at a possible "wedding" of electric refrigeration and ice refrigeration, suggesting that a refrigerator be built using both an electric refrigeration unit and ice, to combine the advantages of both types of refrigeration.

### Future Commercial Market

"The future market for commercial refrigeration," Mr. Johnston told the assembly, "is almost unlimited. An enormous number of new applications have been turned by sales and engineering organizations."

"The commercial end of the refrigeration industry has more possibilities for the engineer in that he can devote more thought and money to this phase of the industry," Mr. Johnston declared.

Up to a certain limit, the so-called small machine can do a very successful job, Universal Cooler's president declared. That limit, now around 3 tons, will some day be as high as 10 tons, he predicted.

"One thing that has run up the cost of commercial refrigeration has been the lack of definite standards for commercial refrigerating machines," the speaker averred.

"General Foods Corp., in trying to find the right type of equipment for its retailers of frozen foods, found it necessary to ask the companies making commercial refrigeration equipment to bring their equipment to General Foods' laboratory in Boston for test."

"This was an expensive process. If an organized body had formulated standards of performance for commercial refrigeration equipment, it would have saved considerable time and expense in this one instance alone."

"The matter of municipal codes is a real problem, especially in the matter of the larger capacity jobs," said Mr. Johnston. "There has been very little 'meeting of the minds' in these code meetings."

### Agreement by Engineers

"What the industry really wants is an agreement on the part of the engineers. If the engineers can agree on more standards, the problem will be solved before it reaches the field," he pointed out.

Mr. Johnston traced the course of the small-machine industry, pointing out how the "high-pressure" sales organizations often oversold the capacity of machines, with the result that considerable time and money was spent in doctoring installations with insufficient refrigeration capacity.

Later, the selling organizations created the vogue of putting in a "battery" of small machines to take care of a job of refrigeration requirements. Soon it became a battle to see who could fill store basements the fastest, Mr. Johnston remarked.

At the present time, however, the small machine industry has rid itself of these "growing pains" and stands ready

to do any kind of a job that may be put up to it in 1933, he declared.

"The executives in this industry have often used unwise tactics in developing sales," Mr. Johnston stated. "The engineer should carry his fight for the use of proper sales appeals to the executive."

"The engineer is not to blame for not having been more aggressive in this respect. Individually, he does what he is told, and dares not do too much more. By collective action, however, he might be able to make an impression on the executive."

### Test CO<sub>2</sub> Thermal Control

In the course of his talk on the subject of solid carbon dioxide, Mr. Schubring declared that the Michigan Alkali Co. is now testing a new type of solid CO<sub>2</sub> thermal control which will maintain constant, desired temperatures and which may speed the acceptance of solid CO<sub>2</sub> in domestic and commercial refrigeration.

This control unit is being tested in connection with a domestic refrigerator and with a large frozen foods container, Mr. Schubring stated. In both cases the tests have showed that constant temperatures are maintained at a cost comparable with either water ice or mechanical refrigeration.

The speaker was questioned by Mr. Loeffel as to how proper humidities were maintained with so great a temperature differential between the refrigerant (at -109° F.) and the air in the food compartment.

### Temperature Differential

Mr. Schubring explained that the temperature differential should be figured as between the solid CO<sub>2</sub> cooling unit and the air in the storage compartment, rather than between the solid carbon dioxide ice and the air in the storage compartment. The speaker did not, however, attempt to explain how humidities were controlled with solid CO<sub>2</sub> refrigeration.

The speaker brought out the fact that government tests have demonstrated that CO<sub>2</sub> gas is beneficial to many foods, and prevents dehydration of some foods kept under refrigeration.

Mr. Schubring also cited the case of a Detroit sausage manufacturer, who was suffering losses on his sausages which were being transported by refrigerated truck. Sausages which remained as leftovers on route trucks during the day, were unsalable the next morning.

The sausage manufacturer, acting on the suggestion of a friend, decided to try solid carbon dioxide refrigeration. The combination of proper temperatures and the escaping CO<sub>2</sub> gas in the truck body interior preserved the sausages perfectly from one day to another, Mr. Schubring averred.

"The Michigan Alkali Co.'s CO<sub>2</sub> plant now has a capacity of 125 tons per day," Mr. Schubring declared. "An estimate based upon the trend curve of the industry indicates that the consumption during 1933 will be between 200,000 and 250,000 tons."

### Engineers at Meeting

Those attending the meeting were:

Carl Baker, Norge Corp.; E. H. Belden, Timken Detroit Axle Co.; S. E. Bickler, Norge Corp.; Howard E. Blood, president, Norge Corp.; L. Brady, Copeland Products, Inc.; L. M. Breaux, Kelvinator Corp.; Geo. B. Bright, George B. Bright Co.; J. C. Buchanan, Norge Corp.; F. M. Cockrell, publisher, Electric Refrigeration News.

L. G. Copeman, president, Copeman Laboratories; A. J. Cordrey, vice president, Zero Ice Corp.; Vernon W. Crone, American Blower Co.; W. Currie, Copeland Products, Inc.; Robert C. Doremus, Geo. B. Bright Co.; H. F. Eidt, Kelvinator Sales Corp.; A. C. Ellerbusch, Frigidaire Corp.; Don G. Ellis, Kelvinator Corp.

P. E. Fay, Dry Ice Corp. of America; A. V. Frohnapel, Kelvinator Corp.; D. H. Gerhard, Consumers Power Co.; R. A. Girvin, Pittmans & Deans Co.; Harry C. Hayes, American Blower Co.; D. P. Heath, consulting engineer; Ray S. Hemmingsen, Johns-Manville Sales Corp.; N. A. Hendwood, vice president, Commonwealth Brass Corp.

M. B. Hoagland, Detroit City Service; E. F. Hubacker, Norge Corp.; R. M. Hyde, McCord Radiator Co.; Wm. Jabine, Frozen Foods Assn.; G. M. Johnston, president, Universal Cooler Corp.; Hugh E. Keeler, University of Michigan, Ann Arbor; L. S. Keilholtz, Norge Corp.; E. C. Ketchum, Mitchell & Smith, Inc.

C. A. Klrn, Mengel Body Co.; Geo. H. Kittredge, Geo. B. Bright Co.; A. E. Knapp, Kelvinator Sales Corp.; Chas. M. Lee, Wood Conversion Co.; A. G. Loeffel, Detroit City Service Co.; Ralph D. Lombard; O. G. Lonskey, Copeland Products, Inc.; Mary Ellen McCaffrey, Detroit City Service Co.; D. J. Martin, Detroit City Service; John C. Mathews, vice president, H. M. Robins Co.; John R. Miller, Frigidaire Corp.; Emmett J. Mueller, Vilter Mfg. Co.; Royal Geo. Nelson; J. M. Ober, Standard Refrigerator Appliance; G. Roy Ohmare, Kelvinator Corp.; Bruce W. Palmer, Palmer Electric Co.; P. D. Parker, Kelvinator Corp.

Tom S. Pendergast, Universal Cooler Corp.; L. A. Philipp, Kelvinator Corp.; Harry J. Potter, Pittmans & Deans; Milton A. Powers, Timken Silent Automatic Co.; C. H. Purdy, Consumers Power Co.; Phil B. Redeker, Electric Refrigeration News; Ira H. Reindel, Norge Corp.

F. B. Riley, Standard Refrigerating Appliance; H. M. Robins, president, H. M. Robins Co.; John T. Scheffer, Electric Refrigeration News; A. C. Schubring, Michigan Alkali Co.; Hugh J. Scullen, Kelvinator Corp.; G. Snider, Norge Corp.; George F. Taubeneck, Editor, Electric Refrigeration News.

P. Tazelaar, Commonwealth Brass Corp.; LeRoy A. Volberding, Norge Corp.; A. C. Wallich, Carrier Engineering Corp.; W. W. Watson, Detroit Ice Publicity Assn.; Ed G. Willems, c/o Detroit Athletic Club.

## Frigidaire Engineers Install Railway Air Conditioners in Test Car

By C. F. Henney, Railway Air Conditioning Engineer, Frigidaire Corp.

WHEN Pennsylvania dining car No. 7956 was taken off its regular run between New York City and Washington, and headed to the air-conditioning laboratory of Frigidaire Corp. in Dayton, it had completed 27,000 miles of steady operation. The diner is a test car on which engineers of Frigidaire are experimenting with the possibilities of light-weight air-conditioning equipment built into existing rolling stock.

The car was completely air conditioned without any changes to its construction other than minor cutting of the bulkheads, since no additional insulation and no ducts were used.

The entire installation of air-conditioning equipment weighs but 2,400 pounds, exclusive of battery and axle generator, and was installed with comparative ease in a short space of time.

Two of the largest Frigidaire compressors, each with 2½ tons of refrigeration capacity, were placed in the steward's linen closet, and air cooled condensers with separate motor-driven fans slung beneath the car in line with the battery box.

The two cooling coils were placed be-

extreme heat and humidity of Florida, Louisiana, and other southern states could be simulated by the research engineers. At times the temperature outside the car was raised to 105° F., and the relative humidity was 80 per cent.

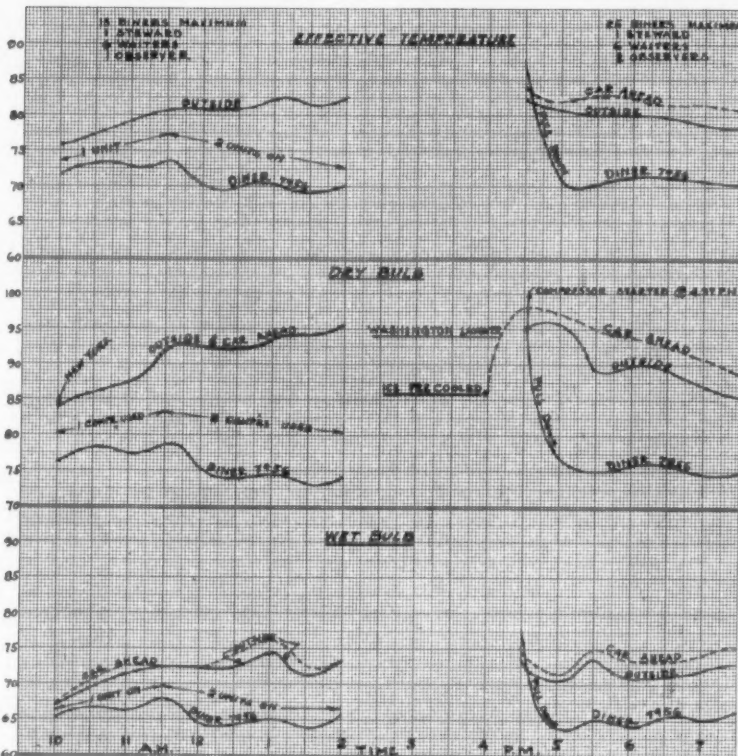
Inside the car electric lamps were strung to equal the body heat of 43 persons plus the heat load of the sun. Electrically heated pans of water were placed in the center of the car to represent the humidity load from body perspiration.

Wet and dry bulb thermometers, anemometers, and other temperature and air-movement gauges were placed in strategic points so that accurate readings could be made. Following these

## Temperatures Held on Test Run

NEW YORK TO WASHINGTON

WASHINGTON TO NEW YORK



The above graph shows the temperatures held on a test run.

hind the bulkhead partitions at either end of the car. Outlet grilles were provided for the cool air ahead of each coil, return grilles at the rear of each coil for recirculated air.

Multivane blowers send the air through the coils, and a regulated amount of fresh air is drawn through oil filters by the main blowers.

The refrigerant known as F-12 and Freon is used. Although the car was in daily use and the equipment functioned day after day under summer heat and humidity, the original charge of Freon has not been replenished.

The steward and other members of the dining car crew reported the car temperature was satisfactory at all times and that the comfort of diners brought many favorable comments.

The car travelled an estimated 27,000 miles without a single service call, and with no other attention given it than the normal routine inspections.

A long narrow house was built over a sidetrack in the rear of the laboratories into which this car, and at alternate times a standard Pullman, was spotted for experiments.

Equipment to heat and humidify the test laboratory was installed so that the

tests, in which tropical heat and humidity were routed, the car was put into regular service between New York and Pittsburgh, and between New York and Washington.

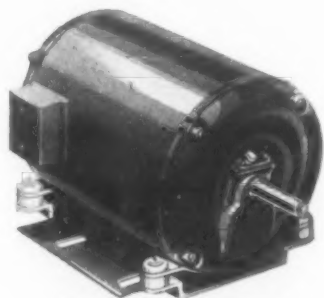
The power for operation of the two air-conditioning compressors is supplied by a 15 kw. axle generator in conjunction with an 800-ampere hour battery.

The electrical lines to the compressors are carried from the battery box through a single conduit, which was installed with little alteration of the car structure.

The energy stored by the batteries is sufficient for operation of the air-conditioning equipment before the start of train runs and at times when the train is standing in stations, insuring the maintenance of comfortable conditions whether the train is in motion or not. The motors that operate the two compressors are rated at five hp. each and operate on 32-volt, direct current.

The control panel is located on the side wall of the compressor room within easy reach of the steward. The steel door to this room is faced with aluminum sheet and insulated with acoustic material to shut out noise and heat from the car.

## SMOOTH, QUIET STARTING and Quiet Operation



Patents allowed and pending

A new member  
of the famous  
"RED BAND"  
motor family

## The New Howell Motor with Built-in Capacitor

This fractional horse power motor is ideal for electric refrigerators. When Howell engineers built the capacitor inside the motor frame, they also simplified construction. There is nothing to get out of adjustment. Long life and economical operation with a minimum of attention are assured.

Now you can power your product with a capacitor motor that is compact, light in weight, neat in appearance, and that has an abundance of power for its rating. Horizontal and vertical types... Rubber or rigid mounting on horizontal models... Stators and rotors for built-in equipment.

HOWELL ELECTRIC MOTORS CO.  
Howell Michigan

## COLD FACTS about

# Artic

Reg. U. S. Pat. Off.

(R & H Methyl Chloride)

## The Ideal Refrigerant for AIR CONDITIONING EQUIPMENT

- 1 Small volume displacement per unit of refrigeration.
- 2 Non-corrosive to ordinary equipment, even if moisture is present.
- 3 Very stable at operating temperatures.
- 4 Provides quick cooling necessary for steady control and efficient operation.
- 5 Operates under a moderately low pressure.
- 6 Gives efficient and practically trouble-proof operation.
- 7 Handled and serviced with ease.
- 8 PRODUCES SATISFACTORY CONDITIONING WITH WIDELY VARYING AIR TEMPERATURES, HUMIDITIES AND VOLUMES.

THE ROESSLER & HASSLACHER CHEMICAL CO.

Empire State Bldg. 350 Fifth Ave. New York, N. Y.



## WOOD CONVERSION CO. USES NEW PROCESS

(Concluded from Page 1, Column 1) under controlled pressure, to the desired density, and forced into a chamber the size of a cross-section of the specified insulation.

The mat thus formed is extruded into a moisture-proof carton of proper dimensions, placed to receive it from the forming machine. The compressed fiber is held under pressure while the carton is sealed, which increases the tendency of the finished slab to expand.

"It is possible to compress the slab just enough to conform to any irregularities of the porcelain lining," Mr.

### Before Baling



H. & F. fiber ready to be baled.

Corlette says, "yet the slab is substantial and adds rigidity to the cabinet." He also points out that expansion of the slab against the outside of the cabinet is desirable to make a snug fit, and to eliminate any "tinny" sounds.

H-F fiber is a specially prepared wood fiber, and should not be confused with raw ground wood or paper pulp, he explains. When formed into a slab at a density of 4.8 lbs. per cu. ft., it will not settle, he claims, and retains its resilient properties.

As advantages to the refrigerator manufacturer, Mr. Corlette points to (1) a moderate stock of fiber will meet requirements for the various sizes of slabs needed, since the machine can be adjusted to make different sizes; (2)

### Ready for Shipping



Bales of insulating material ready for shipment.

the refrigerator manufacturer need not carry a large supply of finished slabs at one time, hence can change models without danger of scrapping pre-fabricated insulation slabs; and (3) insulation production can be controlled with other production lines in the plant.

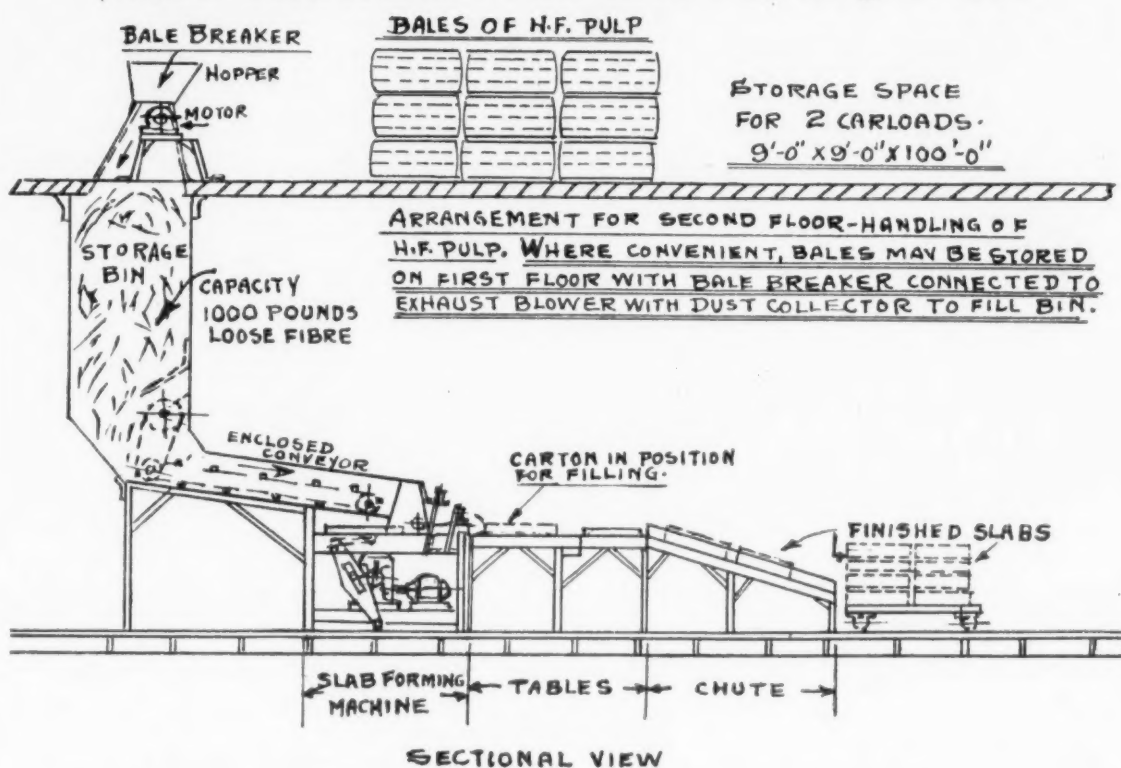
Mr. Corlette estimates that any refrigerator plant making over 5,000 cabinets per year can advantageously employ the new process.

A movie film of the process is being shown to refrigeration executives at various plants, together with a presentation of complete cost figures, based on time and material studies.

## Dr. Fain Sees Value of Air Conditioning in War

NEW YORK CITY — Air conditioning as a safeguard in the next war is suggested by Dr. J. M. Fain in a recent issue of *The Chemist*. Air-conditioning systems could be used in high buildings to clear out poison gases, according to Dr. Fain. The concentration of gas would extend only 20 to 30 feet from the ground so that rooms on the upper floors would serve as gas refuges.

## Wood Conversion's New Slab Forming Process



SECTIONAL VIEW

The above drawing shows the new process used in making slabs of Balsam Wool insulation

## Vancott Talks to Los Angeles A.S.R.E. on Evaporator Capacity

(Concluded from Page 1, Column 4) following question, "How do you arrive at the fin size and number of tubes necessary? I can take a large fin, say a foot or 18 in. square, and put a large tube down the middle thus getting the same proportion of refrigerant to coil surface that you have but it won't work and I want to know why?"

### Answers Question

Mr. Vancott answered this by saying, "It has been determined by experiment that four 1/4-in. tubes are sufficient to absorb the heat from 5 1/2 x 6-in. fins spaced 1 in. apart, and also that it is not economical to have fins extending over 1 in. away from the tube. The second inch gives only about 50 per cent efficiency of the first inch. In large fins, of course, conductivity of the metal becomes the determining factor instead of the transfer of heat from air to fins."

"Various figures are used for ratios between coil and box surface, varying from 100 per cent down to 66 2/3 per cent. I use 70 per cent as being common practice. This assumes 3 in. of cork, and normal construction. If box has 4 in. of cork we frequently go down to 60 per cent and if it has 2 in. we go up to 80 per cent. In figuring coil surface we use both sides of the fin and the surface of the tubes."

### Heat Absorption Calculations

Another question from the audience was, "Why do they include both sides of a fin in figuring heat absorption? I shouldn't think the metal thickness would allow this."

"This is done," said the speaker, "because the metal has more than enough conductivity to carry all the heat which both sides of the fin will absorb."

Still another question was, "Why space fins 1 in. apart? Why not use 1/2-in. spacing?"

He replied, "Under some unusual conditions 1/2-in. spacing might be used, although the number of tubes would have to be increased, probably to 6. One-half-in. spacing under test, won't give twice as much absorption as 1-in. spacing, and so it wouldn't be resorted to unless space was at a premium. I might say here that the absorption of coil surfaces is normally taken at 2.5 B.t.u. per sq. ft. of coil surface per degree difference in temperature between box and coil."

"In figuring refrigeration load," continued the speaker, "the old idea was to use the cubical contents of the box in designing the coil. Now we never use anything but the outside surface of the box. Obviously, by using different shapes, several boxes of the same cubic

capacity could all have different outside surfaces and so different amounts of heat leakage."

### Machine Capacities

Next he turned to the subject of machine capacities. "The common factory capacity test is the Ingersoll Rand method. In using this method, a tank of any size is fitted with a pressure gauge and the compressor discharge is led into this tank. At the tank outlet is an orifice of a predetermined size."

"When the compressor is running, it will maintain a certain pressure on the tank and using this pressure and the size of the orifice the number of cubic feet of free air per minute can be computed, this information actually being available in tabular form."

"Frequently, two units of the same size and rating have different capacities. I'm reminded of a case manufacturer who was testing two units of the same size on two- and three-ply glass cases. To the surprise of all, the unit on the two-glass case showed a better performance than the one on the three-glass case. Finally the units were switched and the difference in capacities then became apparent."

"At standard coil rating of 86° F. discharge and 5° F. evaporator temperature, saturated sulphur dioxide vapor occupies 6.42 cu. ft. per pound, at -35° F. a pound occupies 19.5 cu. ft. and at +32° F. 3.4 cu. ft."

### Overspeeding Compressors

"Similarly, at 86° F. discharge temperature and 5° F. coil temperature, saturated methyl chloride vapor occupies 4.53 cu. ft. per pound, at -35° F. 11.00 and at +32° F. 2.67 cu. ft. These figures will give a good idea of the compressor capacities needed at various back pressures to do a given amount of work."

"Overspeeding compressors in order to increase capacity generally results in a great loss of efficiency. Oil pumping, which becomes very bad at high speeds, causes a large amount of this efficiency loss," he pointed out.

At the conclusion of the talk a discussion took place regarding various types and capacities of air-cooled radiator condensers, but a wide difference of opinion was found to exist on this subject.

## 6 KELVINATOR MACHINES INSTALLED IN HOSPITAL

PROVIDENCE, R. I.—Post & Lester Co., Kelvinator distributor here, has completed installation of six commercial units in the Providence Lying-In Hospital of this city.

One WF-41 condensing unit was installed to cool water for nine drinking fountains placed at various points throughout the building. Five WRB-550 units were placed in the hospital, two of them connected to six walk-in coolers; two to service boxes; and one to a service box supplying 500 lbs. of ice daily.

One WFB-150 unit is connected with three 60 cu. ft. service boxes. New equipment replaces a CO<sub>2</sub> compressor requiring a 25-hp., 550-volt motor, two circulating brine pumps each requiring a 7 1/2-hp. motor, and one water cooler and pump requiring a 1 1/2-hp. motor.

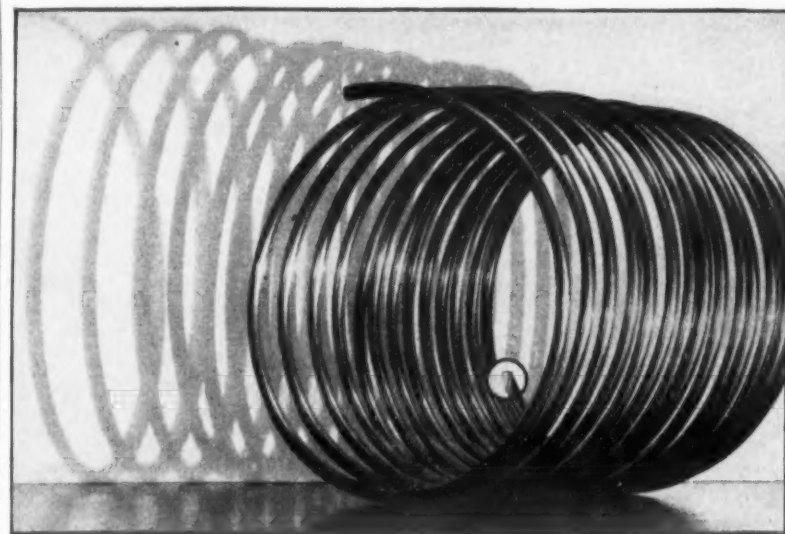
According to George W. Hubbard, hospital engineer, the new equipment has effected a saving of more than \$150 per month in current consumption.

## York Equipment to Cool New Federal Buildings

(Concluded from Page 1, Column 2)

95° F. and 100° F. and correspondingly high humidities are quite common in Washington, the refrigeration and air-conditioning system will automatically maintain a temperature of 75° F., and a low comfortable relative humidity.

This is to be accomplished by passing the air over sprays of refrigerated water, supplied by three large Freon (F-12) refrigerating machines.



## FRENCH TUBES to fill every standard and special need

THERE ARE French Copper Refrigeration Tubes . . . small diameter and thin wall seamless tubes . . . for every refrigeration requirement.

Stock sizes are 1/4 in., 3/8 in., 7/16 in., 1/2 in., 5/8 in., and 3/4 in., all in .035 in. gauge. Heavier gauges can be made to order. Stock coils are 25, 50 and 100 feet long. Longer lengths can be supplied at short notice.

French Deluxe Copper Refrigeration Tubes are free from oxide and foreign matter. Each coil is completely dehydrated sealed, rigidly tested and reaches you ready for use. For manufacturers who prefer to do their own dehydrating, the French Manufacturing Company produces copper tubes dried (commercially dehydrated), with either open or closed ends.

All French Copper Refrigeration Tubes possess the requisite properties for lasting, dependable service. Their grain structure is uniform. This important quality is in every coil because highest metallurgical skill, long manufacturing experience and only the best of raw material go into their production. Additional information will be furnished upon request.

THE FRENCH MANUFACTURING CO.  
General Offices: Waterbury, Connecticut



## FRENCH REFRIGERATION TUBES



## Chicago Steamfitters Devise Standards For Refrigerating Equipment

By Deane E. Perham, Refrigerating Engineer,  
Chicago Master Steamfitters' Association

REFRIGERATION is one of our basic industries with a background of over 50 years. It is founded upon sound engineering plus practical experience. Industry, health, and distribution of our foods are dependent upon it. Recent years have seen a rapid growth in the demand for refrigeration for domestic and small commercial purposes but the fundamentals of refrigeration remain the same.

Therefore, it is obvious that practical engineering standards, correct installation, and proper capacity are important for the success of domestic and small commercial refrigeration because these systems are usually too small in capacity to absorb any errors of guesswork or faulty installation.

The reputable manufacturer builds good equipment under the direction of experienced engineers. But for successful performance that equipment is dependent upon those who sell and install it. It depends whether or not the proper size, type, and capacity is correctly installed to fit the conditions that exist on the premises of the user.

### Picture Painted for Prospect

The prospective user is told of the many advantages and the economy of mechanical refrigeration, such as better food preservation, purchase and storage of several days food supply, an abundance of ice cubes, preparation of frozen desserts, serving an entire meal of cold foods, and if we are honest with the prospect we will say that the average 6- or 7-cu. ft. refrigerator with its 3-in. insulation costs no more to operate than the average 4- or 5-cu. ft. refrigerator with 1½ in. or 2 in. of insulation. The improved air circulation in the larger refrigerator also means added economy and better results.

That is the picture of refrigeration usually presented to the prospective user and if the equipment installed in each instance measured up to this picture, the industry and the user would both be benefitted.

### Survey of Installations

A survey of hundreds of existing installations of all makes and types in Chicago is somewhat disappointing because it shows that very few have ample food space or proper cooling capacity correctly located, to provide the required results in hot weather.

The food heat load, ice freezing heat load, and over half of the wall heat load is heat that must be removed in a period of eight to twelve hours during the hottest hours of the hottest days. This peak hourly load must be matched by an equal hourly cooling capacity during the same hours.

Some installations have water-cooled condensing units, which is favorable, as the water supply in Chicago seldom exceeds 70° F. Other installations have air-cooled condensing units, some of which are located in basements where air temperatures of 70 to 80° are favorable, but the unit is so located that the quantity of air is restricted.

Other air-cooled units are located in kitchens and pantries where air temperatures exceed 100° F. in summer, and

in addition have an air supply restricted to a small per cent of the volume required.

The result of restricted air supply and excessive air temperature is that on the days of largest heat load the condensing unit has its capacity reduced 35 to 50 per cent, and the cooling capacity of the system suffers in proportion.

That is a severe handicap for the mechanical equipment whose manufacturer intended it should have a liberal supply of condensing medium at favorable temperatures. Furthermore, overworked, overheated equipment shortens its life, increases operating costs, and leads to unnecessary service and repair.

### Heating Principles

Refrigeration and heating are terms applied to similar equipment as both refer exclusively to heat-handling devices. The handling of heat must conform to certain fixed laws or principles. Therefore the importance and necessity that the size, location, and installation of equipment conform to conditions that permit each piece of equipment to function in conformance to these fixed laws and principles.

It is unfortunate that the domestic refrigeration business seems to have wandered into a contest to determine who can sell the smallest and lowest priced unit, or who can boast of the longest service plan.

To one who is familiar with refrigeration and its operating performance this program of small equipment and long term service plans seems a most expensive and harmful program for the industry because no matter how low the price, or how long the service plan, the user's impression of refrigeration is gained from its year around performance.

Did you ever hear a user of domestic refrigeration say that the refrigerator food space is too large? On the other hand it is common to hear users express the desire and need for more food space.

### Installation Important

Domestic refrigeration can achieve its greatest success and be made more profitable to manufacturer, dealer, and owner by making each installation more useful, more economical, and more satisfactory to the user. This can be accomplished by selling good insulation, larger refrigerators with more food space, and mechanical equipment having ample cooling capacity when operating from one-fourth to one-half of the time.

A worth-while example is commercial and industrial refrigeration where each installation is measured by operating results. Success was due to educating commerce and industry to the diversified

## Tables Used in Determining Equipment

Table No. 1—Compressor Rating Pounds Per 24 Hours

Kind of Refrigerant	Suction Pres. Lbs. Gage	Suction Temp. Deg. F.	Discharge Pres. Lbs. Gage	Discharge Temp. Deg. F.	Max. RPM	Max. per Min. Piston Speed	Displacement per Min. per Ton Cubic Feet
Carbon Dioxide	CO <sub>2</sub>	317	5	1025	86	400	1625 .94
Ammonia	NH <sub>3</sub>	19.8	5	153	86	375	6912 4.0
Methyl Chloride	CH <sub>2</sub> Cl	6.2	5	80	86	375	13824 8.0
Sulphur Dioxide	SO <sub>2</sub>	-2.8	5	51	86	375	20736 12.0
Column No.	1	2	3	4	5	6	7

Table No. 2—Pounds of Refrigeration Required For Each Refrigerator

Condenser Cooled By	4	5	6	7	8	9	10	12	14	16	20	25	30
Water	50	55	63	67	83	88	100	117	124	137	174	185	200
Air	60	66	75	87	100	110	120	140	150	165	210	225	240

NOTE—Table 2 is based on 2-in. minimum insulation, of material averaging 7 B.t.u. per degree, per square foot, per 24 hours for 1-in. thickness.

Table No. 3—Capacity of Cooling Unit to Use For Refrigerator

Refrigerator insulation 2-in. minimum	4	5	6	7	8	9	10	12	14	16	20	25	30
Average weight ice cubes in lbs. per freeze	3	3	4	4	6	6	7	9	9	10	15	15	15
Minimum sq. ft. surface active cooling cabinet	3.5	4	4.3	4.6	5.3	5.6	6.5	7.2	8	8.5	9.7	11	12.5
Capacity lbs. refrigeration per 24 hours T-t=25° F.	35	40	43	47	53	58	65	72	79	85	98	109	124

NOTE—Table 3. Cooling unit surface and capacity does not include ice freezing load. See Table 4.

Table No. 4—Itemized Refrigerator Load in Pounds of Refrigeration Per 24 Hours

Refrigerator insulation 2-in. minimum	4	5	6	7	8	9	10	12	14	16	20	25	30
Sq. Ft. exterior surface	24	28	30	33	36	40	44	49	54	58	67	75	84
Wall (T-t=50° F.).....lbs.	30	34	36	40	44	49	54	60	66	71	82	91	102
Food and service.....lbs.	5	6	7	7	9	9	11	12	13	14	16	18	22
Ice 2 freezes 12 hours.....lbs.	15	15	20	20	30	30	35	45	45	52	76	76	76
Total load.....lbs.	50	55	63	67	83	88	100	117	124	137	174	185	200

Table No. 5—Pounds of Refrigeration Per 24 Hours Per Square Foot of Surface

For insulating materials averaging 7 B.t.u. per degree per sq. ft. per 24 hours, 1 in. thick 50° F. difference.	Inches thick	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
Lbs. per sq. ft.		1.62	1.21	.97	.81	.69	.60	.48	.40

uses and economies of refrigeration followed by satisfactory operating results.

Another practical example is heating. Many years ago the heating industry did not have the wealth of practical experience and engineering standards pertaining to installation and operation of heat-handling equipment that became available in later years.

The practices and unfavorable results were comparable with domestic refrigeration today because both are heat-handling systems, and heat performs as heat regardless of the name we apply.

By making each heating installation conform to approved engineering practice and standards, and by educating the user how to realize the greatest usefulness, comfort, and economy the industry made rapid strides. Today it is one of the leading industries.

Its success was founded on good engineering practices, satisfactory performance, and constructive education of the user. When heating or refrigeration are made to supply maximum usefulness and economy, the initial sale price is of minor consideration. It will take care of itself.

### Worth-While Investment

Usually the reputable owner of refrigeration is interested in good operating results and a worth-while investment because he learns that good equipment, of ample size, correctly installed, is the lowest cost and most trouble-free refrigeration he can obtain.

Reputable makes of equipment correctly installed seldom require service, and it is cheaper for the owner to pay for service if required rather than to pay in advance. It is cheaper for the seller to render good service when needed than to be obligated by a misleading service plan which can be misinterpreted and abused at the expense of the seller.

If something happens to an installation that is no fault of the equipment or the persons who installed it, repairs or replacements are a legitimate charge, but if the owner holds any kind of a service plan he will usually protest the charge under his interpretation of the plan.

If an adjustment of the charge is made the seller has assumed an expense which is not his. If no adjustment is made the customer is usually dissatisfied.

Therefore it seems that a long period service plan has no place in domestic refrigeration because the seller can serve the user better without it and the user saves nothing by having it, except instances where the user can gain some advantage by misinterpretation of the service plan.

Experience proves conclusively that each domestic or small commercial refrigeration system of reputable make can be made to perform satisfactorily if correctly installed.

Operating experience shows that correctly installed refrigeration will meet the variable demands, maintain temperatures in hottest weather, operate at lower cost, and last for years with service or repair calls few and far between.

### 'Certified Refrigeration'

The conditions discussed in this article explain the reason for, and the purpose of "Certified Refrigeration." It is a constructive aid to the industry in making refrigeration more useful and more economical to the customer.

It is a practical means of educating the users and prospective users to the advantages and economy of good insulation, larger refrigerator food space, ample cooling capacity, proper location, and correct installation.

"Certified Refrigeration" cooperates with the reputable manufacturer to

make each installation fit its work so that the equipment may function in the manner the factory engineers designed it for and under conditions favorable to its operating principles.

Some of the domestic "Certified Refrigeration Engineering Standards," with explanation of their use follow. These standards are subject to revision from time to time as may be necessary to keep pace with improved design and progress of the industry.

The reader should bear in mind that these standards are for use in the Chicago area and that some of the values may not suit certain other localities having different climatic and temperature conditions.

### 70° Water Supply

They also apply only to installations where the condensing unit has an adequate supply of 70° water, or if air cooled a liberal supply of air at 70 to 80° and not less than 100 c.f.m. for the smallest size condensing unit.

To arrive at the standards shown, the Chicago Master Steamfitters' Association has endeavored to use factors that recognize superior design of mechanical equipment and that will encourage better application to bring about improved operating performance. Formulation of the factors shown in the various tables is the result of an extensive survey and study of operating systems of every type and make.

### Tables Explained

Table 1 is for calculating the capacity of a compressor in terms of pounds of refrigeration per 24 hours. Determine the displacement of the compressor to be used in terms of cubic inches per minute as calculated from the bore, stroke, number of cylinders, and r.m.p.

This displacement divided by the figures shown in Column 7, opposite the kind of refrigerant used, gives a quotient in terms of tons of refrigeration per 24 hours. To convert into pounds of refrigeration per 24 hours, multiply the quotient by 2,000.

Table 2 states the pounds of refrigeration compressor capacity that should be allotted to each refrigerator cabinet of a given cubic content. Minimum insulation 2 in. thick.

It is not intended that air-cooled condensers shall be discouraged, but experience shows that building space in most instances does not permit operation under normal conditions.

Table 3 shows the cooling unit capacity, for a given size refrigerator, in terms of minimum square feet of active external surface and pounds of refrigeration per 24 hours, exclusive of ice

## TESTS ON FREEZING OF MEATS REPORTED

By Doctor R. Heiss, Refrigeration Institute, Karlsruhe, Germany

The purpose of this investigation was to determine the required refrigeration capacity for meats at various freezing temperatures. As the latent heat of freezing for water is known, it is possible to determine the quantities of water frozen out of meat at certain temperatures, as well as the cryohydration points of the solution.

The investigation is important first, because the measurements made hitherto in regard to the required refrigeration capacity show variations up to 100 per cent, and no definite data for the calculation of refrigerating plants exist.

Furthermore, the quantity of frozen-out water being important for the restoration ability of the tissue, the measurements therefore are valuable to show how low the freezing temperatures may go, and still produce a faultless marketable meat.

The importance of the investigation is likewise based upon the fact that in the United States, for the past few years, foodstuffs have been kept fresh by the rapid-freezing method, and it seems probable that this cold storage method will be employed in the European foodstuff industries in the near future.

In the investigation, the dilatometrical method of measurement was applied first. By this method the increase in volume and the quantity of frozen-out water were determined.

Calculations show that the gases absorbed within the humid foodstuffs falsify the results of tests in this method, and that an English research work, based upon this method, is incorrect.

Further research was therefore based upon the calorimetrical method. This determined the heat quantity in the meat which shows itself at the freezing or at the thawing of the test pieces of meat. A special calorimeter was designed to test this heat, and a thermostat was developed which kept the temperature between 10° and -30° C. within one hundredth of a degree.

From this investigation it was found that the required refrigeration capacity and the quantity of frozen-out water are greater than was found with the previous calorimetrical methods, but are less than was found by the English dilatometrical measurements.

It was established by this investigation that the required refrigeration capacity is smaller with rapid freezing than with slow freezing. It was likewise shown that by cold storage of the rapidly frozen foodstuff part of the water freezes subsequently in the storage room. Additional tests are being made now to determine the influence of the freezing time upon that subsequent action.

At the present time the difference in the crystals formed in rapid freezing and in slow freezing is considered the reason why smaller refrigeration capacity is required for rapid freezing than for slow. The accuracy of the measurements is approximately one per cent.

Further extension of the research is contemplated as follows: first, the influence of the speed of crystallization must be determined more exactly, which will probably require an extensive investigation about the speed of crystallization, the speed of development of germs, and the number of crystallization centers in their dependence upon the temperature.

Secondly, further measurements must be made upon other humid organic foodstuffs, such as fishes, fruits, and vegetables.

cube freezing capacity. See Table 4 for itemized load.

Table 4 shows the average square feet of external surface for a refrigerator of given size, and the last line shows the total refrigerating load created by full demand from the refrigerator.

Table 5 shows the importance of sufficient insulation. For example, 2 in. or more of approved insulation, compared with 1½ in. or less, will show a substantial annual saving in power cost at the average rates for electric energy.



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## How to Start an Independent Service Station

As Told by Leo C. Jonas, Philadelphia

INASMUCH as most business comes over the telephone, the refrigeration service shop need not be located in a district of high rents. In fact, if the repair-man should develop a trade in second-hand machines, he will find that the class of people who look for bargains of that sort will shop around the side streets.

But the street should be wide enough to accommodate a truck backed up for loading and unloading. The door of the shop should be wide enough to allow a large refrigerator to pass through easily, and the floor should be about as far above the street as the floor of a truck so as to avoid unnecessary lifting.

The floor of the shop should be of wood with space underneath to insure dryness. Stone or concrete floors are often damp. If possible a space of about 50 sq. ft. should be arranged so that it can be cut off by means of sailcloth curtains or movable partitions. This space may be heated to simulate the conditions in a hot kitchen. Sometimes a machine will perform satisfactorily in the cool air of the shop, but will balk if set up at home. Too small a space may smother the condenser.

### Daylight Needed

There must be plenty of daylight and electric outlets for lights and power. The shop should be well ventilated so that air can be quickly changed in the event of escaping gases.

There should be no continuous noises in the neighborhood of the shop, because the refrigeration mechanic must often listen closely for hisses, bubblings, and gurglings inside the machine on which he is working.

An important piece of furniture will be a filing cabinet, one with two or three deep drawers and two or four shallow drawers. The cabinet will be used to store literature. The mechanic should have as much printed matter at his disposal as possible.

Send for service manuals of every machine likely to be found in the district. Send also for pamphlets and instruction sheets issued by the manufacturers of various parts.

### Collection of Clippings

The shallow drawers of the cabinet will be used for a collection of clippings. Such a collection will soon be very valuable. Every number of the *ELECTRIC REFRIGERATION NEWS* alone will make a good collection, but cut out any clipping which may be useful some day, no matter where you see it (except in the Public Library).

The clippings will comprise technical news articles and informative advertisements. Mount the shorter clippings on cards properly labeled, the longer ones are placed in envelopes. File these in alphabetical order by subjects, thus: Advertising Ideas, Belts, Cabinets, Compressors, Condensers, Copper, Electrical Appliances, (but Motors should fall under "M" and Switches under "S"), Expansion Valves, Float Valves, Freezers, Hardware, Insulation, and so on down the alphabet, remembering Sales Ideas, Shop Practice, and Tools.

The quickest, and in the end the cheapest way to get business for a shop is through a moderate amount of adver-

tising, the daily newspapers and the classified telephone directory being the best media.

The telephone number should be given prominence. It is really more important than the owner's name and address. If it should become necessary to remove the shop to another location, the telephone number should be retained if possible.

The advertisement in the telephone directory should be a plain card:

### ELECTRIC REFRIGERATION REPAIRS AND SERVICE

TEL. 1234

John C. Doe

456 N. Front St.

Advertisements in the newspapers should appear at frequent intervals during the warm season, beginning in early spring. During the winter the newspapers should be used sparingly, and not at all just before Christmas.

### Large Home Circulation

Newspapers having a large home circulation are better than those having mostly news-stand circulation (most tabloids fall under the latter class). The "Women's Page" of the Sunday papers and the same page in the Saturday evening papers are best. The large advertisements of the department stores are usually absent in the Saturday evening papers, and a small ad has a better chance of being seen.

The regular newspaper advertisements should be varied, but the ad should always carry a line which suggests some action on the part of the reader, such as, "Cut this out and paste inside the door of your electric refrigerator." It is surprising how many people will follow such a hint.

The repair-man frequently has opportunity to sell new or second hand machines. He should therefore have connections with at least two agencies for machines at high and at medium prices to cash in on such prospects. Sometimes the owner of an old model will trade it in for a new machine. The repair-man's commission on the new one may be enough to pay for the old machine so that the latter will really cost the repair-man nothing.

Whenever the mechanic has finished a job he should paste a sticker on the inside of the refrigerator door, showing the telephone number, etc., of the shop.

### Service Charges

The charges for service are made as in other similar trades, namely time plus materials. To fix a price in advance for a repair is somewhat of a gamble because the service differs from that in other industries. When a plumber has repaired a broken pipe he can turn on the water and see at once whether the job is completed or not.

But that is not always the case with electric refrigeration repairs. Sometimes the mechanic will be obliged to spend a long time watching a gage after an adjustment, but to the customer he appears to be idle. An adjustment of an expansion valve may necessitate two or more calls. It is wise to explain this to the customer who may think that the man does not understand his business because he returns to the job so often.

### Handling Telephone Orders

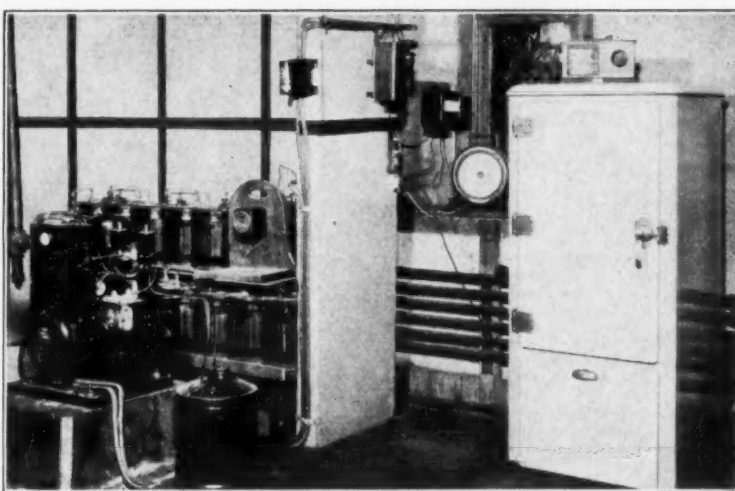
When an order for service comes over the phone or from the customer in person, it is well to diagnose the case as far as possible by asking questions. Sometimes the trouble can be corrected without a visit to the home as in a case where the user has neglected to defrost. These are "Thank you" jobs, but honest advice builds up good-will for the shop. Always ask the name of the machine so that the man who goes to the job will be in some measure prepared for the problem.

"I think it needs gas" is frequently the opinion of the user. People are accustomed to seeing plumbers and automobile mechanics working with wrenches and pliers. The one thing which the refrigeration mechanic does which looks different from these is charging gas, and it is this feature which remains in the customer's mind. Of course, sometimes a machine does need gas. Ask the customer if there was ever any strange odor of chemicals in or near the refrigerator.

After a job is finished a little explanation from the mechanic may prevent a recurrence of the trouble, and, at the same time make good-will for the shop.

The man who thinks that because he

## 'Economy Switch' Test Apparatus



View of the laboratory at Kansas State College where the "economy switch" described below was developed to maintain the storage battery of a farm lighting plant while an electric refrigerator was being operated.

## 'ECONOMY SWITCH' TESTED FOR FARM REFRIGERATION

MANHATTAN, Kan.—Tests of an "economy switch" by which an electric refrigerator may be automatically operated alternately from the generator and the battery of a farm lighting plant were recently conducted by the Engineering Experiment Station of Kansas State College, here. Results of these tests are reported in Bulletin No. 30 of that station.

The studies were made with a 5-cu.

ft. Kelvinator, operated by a 1/4-hp. motor, running from a 32-volt, 800-watt Delco-Light plant. A watt-hour meter measured the energy used by the refrigerator, while an ampere-hour meter recorded the amount of electricity charged and discharged from the storage battery.

The refrigerator was first cooled and operated at no load to determine the number of hours of operation necessary to take care of heat losses through the walls of the cabinet. Then a load estimated to be the average loading of a refrigerator of that size was placed in the refrigerator daily during the tests. This consisted of cooling 28 lbs. of water from room temperature down to about 45° F., and freezing 4 lbs. of ice twice daily.

Two one-week tests were made. The first, test A, with the refrigerator cooled to operating temperatures, was started

Contracting for service to new machines for local agents may be a profitable business. The dealer registers each machine sold with the repair-man and during the term of the guarantee to the user the repair-man will keep each machine so registered in good working order. The charge is a fixed amount per calendar month for each machine, the dealer to supply necessary parts without charge.

The repair-man must get in touch with the service department of the manufacturer for service manual and complete instructions. After the guarantee expires the user is likely to call on the repair-man for service, and is then charged at the regular rate.

### Commercial Service

The servicing of commercial jobs, however, should be done on a "per man per hour" basis because these jobs may call for night or Sunday work. Service to water coolers should also be on the "per man per hour" basis as many of these calls are false alarms. On a very hot day a water cooler may not give complete satisfaction because the water is being drawn too fast. When this is the case, hang a sign on the cooler "Out of order" and return in an hour and take the sign off.

The repair-man is often called upon to give advice about electric refrigerators, and is in good position to do so. It is, of course, never wise to "knock" a machine which is in production.

on a fully charged battery. The automatic starting relay on the plant was disengaged, and the energy all taken from the battery.

As shown in the curve in Fig. 1, the low-voltage cut-out released after 43 hours, indicating a discharged battery. The starting relay on the plant was then adjusted so that whenever the refrigerator motor started, the plant also started automatically to furnish energy for the refrigerator and a 9-ampere charge to the batteries.

The batteries were fully charged again after 31 hours of operation under these conditions. Then the starting relay was again disengaged, and the same procedure followed during the remainder of test A. The refrigerator motor operated 50.3 per cent of the time during this test.

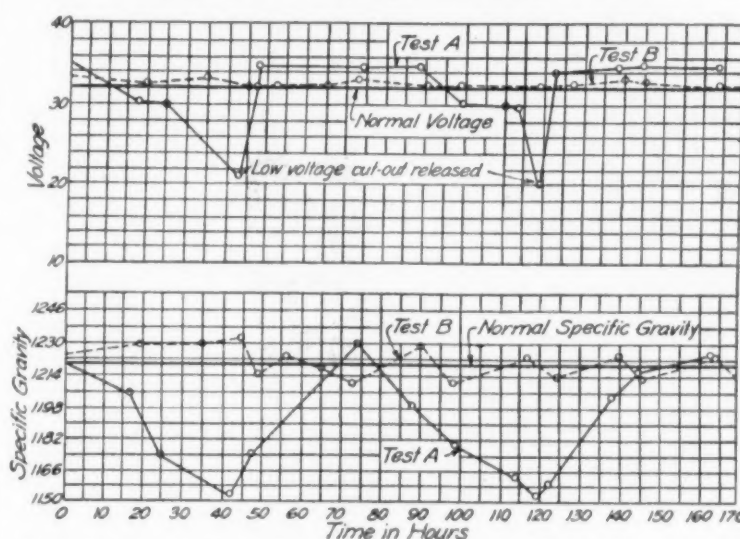
The "economy switch" was used in the second series of tests which also extended over a week. Other conditions were substantially the same, but the "economy switch" was used to throw the refrigerator motor load alternately on the generator and battery, preventing over-charging or undue discharging of the battery.

Fig. 1 shows that the specific gravity and voltage of the battery varied but little during test B with the "economy switch," while in test A the battery alone was soon almost completely discharged. Another advantage of the "economy switch" is the retention of nearly maximum output of the generator without subjecting the batteries to excessive charging or discharging, the report points out.

The amount of gasoline used per kwh. in the two tests showed a slight advantage in favor of test B. However, the chief value of the "economy switch" appeared to be regulation of the charge of the battery.

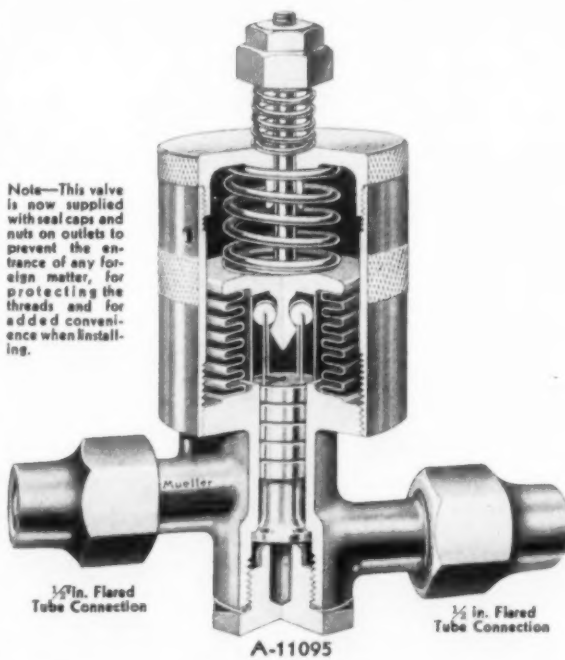
Operation costs of electric refrigerators on individual farm lighting plants are "rather high under the best of conditions," the report states as the result of a survey of Kansas farms. Some users prefer them to ice refrigerators from the standpoint of both convenience and expense however. One owner states that he would not take \$1,000 for his refrigerator if he could not replace it.

## Results of Storage Battery Tests



Variation in voltage and specific gravity of batteries used to operate an electric refrigerator in a series of tests made by the Engineering Experiment Station, Kansas State College. In test A the refrigerator was carried by the battery until the battery was discharged, then by the generator until the battery was charged, then by the battery again. Much better battery conditions were maintained in test B using an "economy switch" to throw the load alternately on the generator and on the battery.

## The New Mueller Two-Temperature Control Valve Will Maintain the Range in Temperature You Require for Refrigerator and Display Case or Cooling Cabinet



Note—This valve is now supplied with seal caps and nuts on outlets to prevent the entrance of any foreign matter, for protecting the threads and for added convenience when installing.

This valve is so constructed that by merely turning the outside knurled case a service man can raise or lower the temperature without danger of losing the differential which has been previously set.

The differential is built into the valve and cannot be changed.

The temperature range may be changed without the necessity of a check or numerous visits of the service man.

Simplicity of construction insures a long and trouble proof service.

The snap action feature prevents seat erosion and assures uniform performance.

The body is a brass forging and is therefore seep proof and free from defects.

NOTE—When Ordering Specify "Cut-In" and "Cut-Out" Readings

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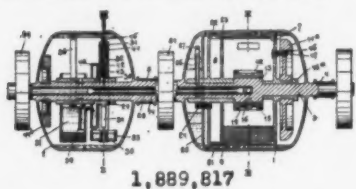
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# Latest Patents in Electric Refrigeration

ISSUED DECEMBER 5, 1932

1,889,817. ROTARY REFRIGERATING MACHINE. Marcel Audiffren, Cannes, and Albert Singrun, Epinal, France. Filed Oct. 23, 1928. Serial No. 314,508. and in France Oct. 28, 1927. 9 Claims. (Cl. 62-115.)



1,889,817

1. In a rotary refrigerating machine of the type described, a condenser, an evaporator, a hollow shaft common to both said condenser and evaporator, a pendulous weighted crankcase mounted upon the hollow shaft in the condenser, a compressor carried by the crankcase, an eccentric upon the hollow shaft for directly driving the compressor, said eccentric having a passage in cooperative relation with the evaporator through the interior of the hollow shaft and periodically presenting its discharge opening to the intake ports of the compressor.

1,889,896. REFRIGERATING APPARATUS. Harry B. Hull and Donald H. Reeves, Dayton, Ohio, assignors to Frigidaire Corp., Dayton, Ohio, a Corporation of Delaware. Filed Feb. 27, 1928. Serial No. 257,227. 6 Claims. (Cl. 62-126.)

2. A refrigerating element for refrigerating apparatus adapted to be placed in the path of circulating air for cooling the air and for freezing ice, comprising in combination a refrigerant conduit, a pair of freezing sleeves disposed in vertical alignment, the outer side of the bottom of each sleeve being directly secured in intimate thermal contact with said conduit, and an open refrigerant conduit surrounding the first mentioned conduit and both sleeves to chill air circulating over said element to prevent absorption of heat by said air from the sleeves.

1,889,917. REFRIGERATING SYSTEM. George Hilger, Chicago, Ill. Filed Nov. 16, 1929. Serial No. 407,583. 13 Claims. (Cl. 62-126.)

1. A refrigerating system comprising, in combination, a unit having a space adapted to contain separated liquid and vapor phases of the refrigerant, an inlet line for supplying refrigerant under pressure to said space, an oil drain opening from the bottom of said space, and an outlet line having its inlet disposed at the predetermined normal level of the liquid for discharging vapor or vapor and entrained liquid from said means.



**PATENTS**  
Searches, Reports, Opinions by a  
Specialist in REFRIGERATION  
**H. R. VAN DEVENTER**  
Solicitor of Patents - Refrigeration Engineer  
342 MADISON AVE. NEW YORK

space to a pressure lower than the inlet pressure.

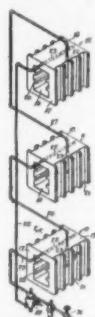
1,889,956. METHOD OF PRODUCING AMMONIA. Philip H. Falter, Orange, N. J., assignor to American Cyanamid Co., New York, N. Y., a Corporation of Maine. Filed Feb. 27, 1929. Serial No. 343,246. 9 Claims. (Cl. 23-194.)

1. A process of making ammonia from cyanamide which consists in adding cyanamide and water to a vessel, raising the temperature thereof to at least 160° C. and maintaining at least that temperature until the reaction is substantially complete, beginning the discharge of ammonia after the charge reaches 160° C. and removing substantially all the ammonia generated while the charge is above that temperature.

9. The process of making ammonia from cyanamide which consists in applying steam to cyanamide in a closed vessel to bring about a reaction and when a temperature of 160° C. is reached, cutting off said steam, withdrawing from the chamber only enough ammonia to enable the exothermic reaction to continue and maintaining the temperature at or above 160° C. until the reaction has been completed, and then exhausting the ammonia from the vessel.

1,889,988. REFRIGERATING SYSTEM. George Hilger, Chicago, Ill. Filed Sept. 17, 1928. Serial No. 306,583. 23 Claims. (Cl. 62-115.)

1. A refrigerating system comprising, in combination, a refrigerating unit having a space adapted to contain separated liquid and vapor phases of the refrigerant, inlet means for supplying refrigerant at a predetermined pressure, and outlet means for



1,889,988

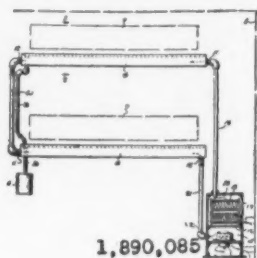
discharging refrigerant at a pressure lower than said predetermined pressure, said outlet means opening from said space at a substantial distance from the top, the liquid tending to rise to said outlet means, and the vapor entering said outlet means tending to entrain liquid when the level of the latter is at or above the inlet of said outlet means.

1,890,072. COOLING SYSTEM. Claud H. Bills and Glenn G. Griswold, Los Angeles, Calif. Filed Feb. 17, 1931. Serial No. 516,322. 4 Claims. (Cl. 261-111.)

1. A cooling tower comprising a housing, a vent chamber rising from the top of said housing, baffle means in said vent chamber, an air tunnel extending transversely through the housing, said tunnel being open

at the ends thereof whereby air is supplied to the housing, a vent rising from the air tunnel and provided with louvers through which air is admitted into the housing, and through which the water to be cooled is forced.

1,890,085. DEFROSTING DEVICE FOR REFRIGERATING CASES. Clement V. Hill, Trenton, N. J., assignor to C. V. Hill & Co., Inc., Trenton, N. J., a Corporation of New Jersey. Filed June 9, 1930. Serial No. 459,960. 13 Claims. (Cl. 62-89.)



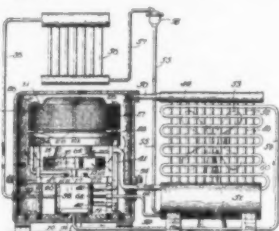
1,890,085

1. The method of defrosting the cooling coils in a refrigerator having drip pans beneath the coils, which consists in shutting down the refrigerating apparatus, passing comparatively warm medium through the drip pans, and expelling the water of condensation together with the warm medium from said pans.

1,890,110. WATER-COOLED REFRIGERATOR. Edward R. Doepeke, Fairfield, Wash. Filed June 14, 1932. Serial No. 617,208. 2 Claims. (Cl. 257-21.)

1. A water cooled refrigerator of the class described comprising a cabinet including an outer wall, a compartment in said cabinet including a cylindrical wall, and upper and lower closing heads, packing interposed between the compartment and cabinet wall, the frontal portion of the cabinet having entrance openings and insulated closing doors therefor, a hollow shell-like article storage device supported in said compartment and including a cylinder and closing head for the opposite ends thereof, together with waterproofing means between the cylinders and compartments, said device being spaced from the wall of the compartment to provide a water circulating space, a valve water supply pipe connected to the lower closing head of the compartment, a valve water return pipe extending up through the water space and into the upper portion of the compartment and having a lateral branch terminating in a water return neck.

1,890,205. REFRIGERATING APPARATUS. George Andersen, Chicago, Ill., assignor to W. B. Parkyn, Chicago, Ill. Filed Jan. 31, 1931. Serial No. 512,671. 27 Claims. (Cl. 62-115.)



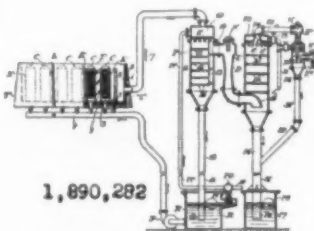
1,890,205

1. In refrigerating apparatus the combination of a compressor, means for actuating said compressor, a receptacle into which said compressor discharges, a condenser in communication with said receptacle, and mechanical means for producing flow of the compressed gaseous refrigerant from said receptacle into said condenser.

1,890,238. COMPRESSOR. Russell T. Smith and Charles H. Smith, Greenville, Mich., assignors to Gibson Refrigerator Co., Greenville, Mich., a Corporation of Michigan. Filed April 15, 1931. Serial No. 530,252. 7 Claims. (Cl. 230-185.)

1. In a compressor, a casing having a bored end wall, a rotating shaft journaled in the bore, an outlet opening in the wall and in communication with the bore therein, the adjacent end of the shaft being hollow and open to the bore continuously, and also to the interior of the casing, the openings from the interior of the shaft to the interior of the casing being adjacent moving parts of the compressor, so as to lubricate them in their movement on the shaft.

1,890,282. REFRIGERATING SYSTEM. Le Roy A. Droscher, Willow Grove, Pa., assignor to C. H. Wheeler Mfg. Co., Philadelphia, Pa., a Corporation of Pennsylvania. Filed March 10, 1931. Serial No. 521,414. 7 Claims. (Cl. 62-172.)



1,890,282

1. A system for producing ice comprising a tank, a plurality of receptacles therein for holding water to be frozen, an evaporator, a connection from said tank conveying cooling medium therefrom to said evaporator in which it is lowered in temperature, means for maintaining high vacuum in said evaporator, a receptacle for cooling medium from said evaporator, a connection communicating with said evaporator through which make-up water is delivered to be commingled with the cooling medium and lowered in temperature therewith, means controlling the delivery of make-up water through said connection in response to variations in the amount of cooling medium

from said evaporator, and means for delivering the cooling medium to said tank.

ISSUED DECEMBER 13, 1932

1,890,451. REFRIGERATING APPARATUS. Frank W. Andrews, Dayton, Ohio, assignor, by mesne assignments, to Frigidaire Corp., a Corporation of Delaware. Filed April 13, 1927. Serial No. 183,469. 6 Claims. (Cl. 62-126.)

5. A cooling unit for a refrigerating apparatus comprising a header adapted to contain liquid refrigerating medium, means for maintaining a substantially constant quantity of liquid in the header and a vertically extending coil connected to the header and disposed laterally thereof, said coil including a plurality of substantially horizontal loops forming an enclosure for a vertically arranged compartment, and being connected at both ends to the header.

1,890,457. REFRIGERATING MACHINE. Merrill Davis, Detroit, Mich. Filed Oct. 25, 1926. Serial No. 144,079. 15 Claims. (Cl. 62-115.)

1. In a refrigerating apparatus the combination with a compressor and expansion and compression chambers adjacent thereto, of means for positively ejecting condensate from the pressure side of the system into the expansion side thereof.

1,890,461. REFRIGERATOR EQUIPMENT. Elmer A. Hamburg, Pittsburgh, Pa., assignor to the Firm of Hamburg Brothers, Pittsburgh, Pa., composed of Elmer A. Hamburg, Louis Hamburg, and Joseph Hamburg. Filed Aug. 7, 1931. Serial No. 555,650. 1 Claim. (Cl. 62-89.)

A liquid container for installation in a refrigerator including a shelf and refrigerating equipment extending upward from the shelf, which container comprises an independent unit tank structure adapted to seat freely on said shelf, the tank being of relatively narrow, tall and elongate dimensions, one of the narrow and elongate faces thereof comprising the bottom of said structure, and the face of the tank opposite said bottom including a removable cover, one of the narrow and tall faces of said container constituting its front face, the container being adapted to seat on said shelf with its front face adjacent the edge of the shelf and with one of its elongate and tall faces adjacent said refrigerating equipment, said front face being provided with a valve outlet which includes a hol-



1,890,461

low, swingable handle which is adapted to be swung to a position overhanging the edge of said shelf, and in such position to effect an opening of said valve outlet, whereby liquid is discharged from the container by way of said hollow handle, and said handle being further adapted to be swung upward to a position against said face, whereby said valve outlet is closed.

1,890,531. AUTOMATIC WEAK LIQUOR CONTROL. Ralph E. Schurtz, Kansas City, Mo., assignor, by mesne assignments, of one-half to R. W. Bailey and C. T. Jobs, Kansas City, Mo. Filed Feb. 4, 1928. Serial No. 251,978. 12 Claims. (Cl. 62-5.)

1. In a refrigerating system of the character described, the combination with a means responsive to heat within the system for controlling distillation, of a means responsive to heat exteriorly of the system operatively associated with the said first named means in counteracting relation.

12. In a liquor control for a refrigerating system of the character described including a still and an absorber a liquid refrigerant absorbent therein, a conduit from the still to the absorber for strong liquid refrigerant, a valve in the conduit, a float in the absorber operatively connected with the valve, and heat responsive means to vary the effective buoyancy of the float.

1,890,626. AIR COOLING APPARATUS. John Q. Sherman, Dayton, Ohio. Filed Oct. 25, 1926. Serial No. 143,992. Renewed July 29, 1932. 19 Claims. (Cl. 62-123.)

11. In an air cooling apparatus, a cabinet separated into two compartments, a cooling unit located in one of the compartments, and a complementary heat exchange unit located in the other compartment, the latter compartment being heat insulated from the first compartment and from the room to be cooled, means for circulating air through the first compartment and discharging same into said room, means for ventilating the second compartment including conduits extending from said compartment to an opening of the wall of the room to be cooled, and a sealing unit for removably connecting said conduits to the opening of the room so that air may circulate from the exterior of the room around the complementary unit in said second compartment.

1,890,641. SODA FOUNTAIN AND ICE CREAM CABINET. William F. Delzer, Milwaukee, Wis., assignor to Western Specialty Co., Milwaukee, Wis., a Corporation of Wisconsin. Filed April 10, 1929. Serial No. 353,981. 10 Claims. (Cl. 62-126.)

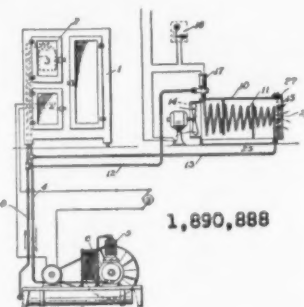
1. In combination, an insulated receptacle, an annular refrigerant container disposed coaxially with said receptacle and telescoping at its bottom with the upper margin thereof to form a cooled compartment, and means for feeding a refrigerant directly into said container.

1,890,771. TRANSPORTATION AND DIS-

PLAY PACKAGE AND METHOD. Donald Watchorn Drummond, New Rochelle, N. Y., assignor to Solid Carbonic Co., Ltd., New York, N. Y., a Corporation of Delaware. Filed Jan. 29, 1931. Serial No. 512,064. 4 Claims. (Cl. 62-91.5.)

1. A transportation package of the type described comprising a substantially airtight, heat insulating casing, an inner receptacle within said casing, a body of refrigerating material within said receptacle, a metal encased package of perishable food products within said casing and heat conducting means between said package and said refrigerant, proportioned to have a predetermined heat conducting capacity.

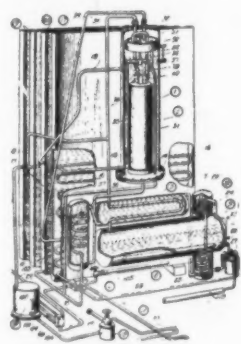
1,890,888. AIR COOLING APPARATUS. John Q. Sherman, Dayton, Ohio. Filed June 26, 1926. Serial No. 118,783. 17 Claims. (Cl. 62-176.)



1,890,888

1. In a ventilating apparatus of the character described, the combination with a refrigerating system having an excess capacity factor of an air cooling apparatus including a refrigerating coil additional to and removed from that of the refrigerating system but connected to and operated by said refrigerating system, an air compartment in which the coil is located, said compartment discharging into a chamber to be cooled, a blower directing a current of air through said compartment and about said coils into the chamber and thermostatic means controlling the operation of said air cooling apparatus independent of the refrigerating system.

1,891,028. REFRIGERATING SYSTEM. Ralph E. Schurtz, Kansas City, Mo., assignor, by mesne assignments, of one-half to R. W. Bailey and C. T. Jobs, Kansas City, Mo. Filed May 18, 1923. Serial No. 639,860. 7 Claims. (Cl. 62-5.)



1,891,028

1. In a continuous absorption refrigeration system, a still, a condenser, a liquefied gas collector, an evaporator, an absorber, and conduits connecting the above mentioned elements, in combination with still-operated means to conduct weak liquor from the still to the absorber, means responsive to variations of temperature in the still for controlling the flow of liquor from the still to the absorber, and cooperatively associated means to conduct liquor from the absorber to the still adapted to operate substantially constantly and simultaneously with the flow of liquor from the still to the absorber, to maintain a predetermined uniform strength of liquor in the still and in the absorber, and a heater for the still.

1,891,167. AIR COOLER. Hiram A. Lockwood, Phoenix, Ariz. Filed March 11, 1932. Serial No. 598,246. 2 Claims. (Cl. 62-131.)

1. A cold air circulating device, comprising a cabinet, a receptacle for a refrigerating agent in the cabinet, a blower fan in the cabinet, a series of shutter valves in the cabinet adjacent to the blower fan means for simultaneously operating said shutter valves, said cabinet having a cold air outlet at one end thereof, a series of shutter valves in the cabinet opposite the outlet, and means for simultaneously operating the shutter valves opposite the outlet, said operating means for each series of shutters comprising shafts journaled in bearings and projecting from the bottom of the cabinet, worms on the shafts, and toothed segments on the trunnions of certain of the shutter valves in mesh with the worms.

## D. P. HEATH SUING MULLINS ON EVAPORATOR PATENT

CLEVELAND—A patent suit has been instituted by Delos P. Heath against the Mullins Mfg. Co., Salem, Ohio, claiming that the manufacture, use, and sale of household evaporators by the latter firm infringes on reissue letters patent No. 18,253, owned by Mr. Heath.

The suit was filed on Oct. 29 in the U. S. district court of Northern Ohio, Cleveland, and is classed in equity No. 4503. The bill of complaint cites the following non-exclusive licenses under the Heath patent: General Electric Co., Crosley Radio Corp., Servel, Inc., and Trupar Mfg. Co. The bill asks that relief be granted from the alleged infringement by Mullins Mfg. Co., a non-licensee.

## New Inventions

THE story of progress in the development of electric refrigeration is vividly pictured by ELECTRIC REFRIGERATION NEWS in the illustrated review of refrigeration patents granted each week by the U. S. Patent Office. Here is news of timely interest and great value to every refrigeration engineer, designer and manufacturer.

In March, 1927, the NEWS began to publish in installments a summary of all refrigeration patents issued up to January, 1927. This preliminary review required many pages of type. It proved so popular with readers that in 1929 a detailed synopsis of each new patent in the field of electric refrigeration became a regular feature of the NEWS.

This review of new refrigeration inventions typifies the aim and purpose of ELECTRIC REFRIGERATION NEWS in serving the refrigeration industry. It also shows why the NEWS holds such a high reader interest among general subscribers as well as specific groups of readers. By giving the industry the kind of business newspaper it wants, the NEWS continues to grow with the industry.

ELECTRIC REFRIGERATION NEWS  
550 Macabees Bldg., Detroit, Mich.



# Du Pont Halted in Attempt to Stabilize Lacquer Industry

## JUDGE SAYS LACQUER PATENT IS NOT VALID

(Continued from Page 1, Column 3)

be paid 4 cents per gallon royalty (minimum \$2,000 per year) immediately, and 6 cents per gallon (minimum \$3,000 per year) if certain claims of the patent were sustained in later litigation. The license contract stipulated that the du Pont company could establish for itself and its licensees a minimum selling price of lacquers covered by the patents.

### Licensed Manufacturers

Among the lacquer manufacturers which accepted the license agreement are the following:

John L. Armitage & Co., Newark  
American Varnish Co., Chicago  
The Arco Co., Cleveland  
Berry Bros., Detroit  
Bloomfield Chemical Co., Harrison, N. J.  
Bradley & Vrooman Co., Chicago  
Devos & Raynolds Co., Brooklyn  
V. J. Dolan & Co., Chicago  
Egyptian Lacquer Co., New York City  
Ferber Schorndorfer Co., Cleveland  
Flood & Conklin Co., Newark  
Forbes Varnish Co., Cleveland  
W. P. Fuller & Co., San Francisco  
Grand Rapids Varnish Co., Grand Rapids, Mich.  
Hilo Varnish Co., Brooklyn  
S. C. Johnson & Son, Racine, Wis.  
Kay & Ess Co., Dayton  
Maas & Waldstein Co., Newark  
Mayer & Loewenstein, Long Island City, N. Y.  
Mountain Varnish & Color Works, Toledo  
Murphy Varnish Co., Newark  
O'Neill Duro Co., Milwaukee  
Pittsburgh Plate Glass Co., Milwaukee  
Pratt & Lambert, Inc., Buffalo  
Scraper & Quinn, Inc., Los Angeles  
Sherwin Williams Co., Cleveland  
Standard Varnish Works, New York City  
Stanley Chemical Co., East Berlin, Conn.  
Thresher Varnish Co., Dayton  
V.E.P. Co., Detroit  
Geo. D. Wetherill Co., Philadelphia.

### Establish Trust Fund

Anticipating the institution of infringement suits by du Pont, a group of lacquer manufacturers established a trust fund of \$70,000 to assist in the defense of such suits. Trustees of the fund were W. M. Rand, Merrimac Chemical Co., chairman; W. I. Longworth, Lilly Varnish Co.; A. B. Nixon, Hercules Powder Co.; L. Phillips, Valentine & Co.; W. C. Dabney, Jones-Dabney Co.; and A. D. Joyce of the Glidden Co.

Some 50 companies subscribed to the fund, including the following: Glidden Co., Valentine & Co., Jones-Dabney Co., Lilly Varnish Co., Merrimac Chemical Co., Cook Paint & Varnish Co., Gilbert Spruance Co., and the Barrett Varnish Co.

Purposes of the trust fund agreement were to collect "reliable and accurate information on the validity and scope of unexpired patents covering low viscosity lacquers," and to contribute toward the defense of any infringement suits as the trustees might deem desirable.

### Correspondence Reprinted

When suits were started by du Pont against the Glidden and Jones-Dabney firms, defense was turned over to Penne, David, Marvin & Edmonds, patent lawyers who had previously made a report contending that the du Pont patents were invalid. Singmaster & Breyer, metallurgists and chemical engineers of New York City, were also employed by the trust fund.

The correspondence between E. M. Flaherty, manager of the industrial

finishes division of the du Pont organization, and R. W. Levenhagen, vice president of the Glidden Co., which culminated in the suit between these two companies is reproduced below.

### License Proposal

E. I. du Pont de Nemours & Co.  
Parlin, New Jersey April 25, 1931.  
Personal  
Mr. R. W. Levenhagen, vice president,  
The Glidden Co., 1958 Union Trust Bldg.,  
Cleveland, Ohio.  
Dear Dick:

I am very pleased to hear of your return from the West Coast and hope that it means you now have time to give enough consideration to our Lacquer Patent License to arrive at a final and early decision regarding it. Most of the larger companies have already accepted the Agreement and we have naturally assumed from the beginning that the Glidden Co. is going to line up with those who are trying to do a constructive job for the industry because I know this has always been your own thought in this matter. The list of signers now includes the following:

Sherwin-Williams, Devos & Raynolds, Pittsburgh Plate Glass, Murphy Varnish, Pratt & Lambert, Bloomfield Chemical Co., Thresher Varnish Co., V.E.P. Co., John L. Armitage & Co., Egyptian Lacquer Co., Arco Co., Forbes Varnish Co., O'Neill Duro Co., Kay & Ess Co., Hilo Varnish Co.

Let me know if there is anything further I can do for you on the Lacquer License matter or anything else you may have pending with us. With best regards, I am  
Very truly yours,  
E. M. FLAHERTY,  
Division manager.

### Questions Validity Of Patents

April 28, 1931.  
Mr. E. M. Flaherty, Division Manager,  
E. I. du Pont de Nemours & Co.,  
Parlin, N. J.  
Dear Ed:

I have your letter of the twenty-fifth and wish to explain that since my return from the Coast I have been so busy that I have not had an opportunity to give careful consideration to the matter of the lacquer patent license.

Today in talking with some of our people I have been impressed with the fact that one of the weaknesses in this whole proposition is the fact that the Ford Motor Co. do not intend to take a license.

I also find that Singmaster and Breyer of New York have secured a lot of information which tends to indicate that the patents are not valid. They approached us to sign an agreement to participate in opposing the patent but we have not done this.

We have, however, been in touch with some of the leading suppliers of our industry and we find a very decided opinion that the patents are not valid and that there is liable to be a considerable amount of litigation and confusion concerning the whole subject.

I would like to suggest therefore that in order that we may have a clear understanding of the whole patent situation that a meeting be arranged, preferably in New York, where the attorneys of the Singmaster and Breyer group, Hercules Powder Co., American Cyanamid Co. and the attorneys of your good company may get together and discuss this whole proposition. Our company will be very glad to be represented at this meeting. This, I feel sure, will clarify the whole situation.

Personally, there are a few things in the license agreement which seem to me, in justice to the signers, should be changed. I refer particularly to the matter of bringing suit against non-signers and an agreement to undertake to defend the patents.

Unless this is done and unless the Ford Motor Co. can be brought into the arrangement I feel that instead of bettering the situation it will be rendered very much worse than at present. Will you kindly think over my suggestions and either telegraph or telephone me your conclusions so that we may be governed accordingly? . . .

With my personal regards, I am  
Yours very truly,  
RWL:T  
Vice President.

### 'Friendly Gathering' Idea Hits a Snag

E. I. du Pont de Nemours & Co.  
Parlin, New Jersey May 2, 1931.  
Mr. R. W. Levenhagen, The Glidden Co.,  
Cleveland, Ohio.  
Dear Dick:

I am disappointed to note from your letter of April 28th that you seem to be a long way from reaching a decision on the question of whether or not you will accept a license under our patents.

It is largely because some of our good friends, to whom we are desirous of showing all reasonable consideration are taking so long to make up their minds that we have been restrained from bringing action, and this in turn is causing a good many people to doubt whether we have any intention of ever putting the patents to a test.

Our offer has now been before you for more than two months, and the fact that many others have found that length of time sufficient to enable them to give it proper consideration in consultation with their legal advisers and come to a decision makes us feel that we should reasonably expect a definite answer in your case without much further delay. We realize that it is a complicated situation, but after all the question of whether it will or will not accept a license is one for each company to decide on the basis of its own judgment.

As to Breyer's information, it seems to me it is up to you to appraise its value and decide upon it to defeat any infringement action that may be brought against you. If you want any help from us on this point, we shall be glad to tell you what we think of this information if you will submit it to us; but we cannot consistently deal directly with Breyer, and we are unwilling to make it the subject of a community gathering such as you suggest. Please do not misunderstand this as reflecting any unwillingness on our part to cooperate; the point is that the question is essentially one that must be settled between us and our prospective licensee in each case, and for that reason does not lend itself with any satisfaction to a joint discussion between several different interests.

We are just as anxious as you appear to be to bring the issue to a head, and trust you will be good enough to cooperate to this end by definitely accepting or declining the offered license at any early date.

Yours very truly,  
E. M. FLAHERTY,  
Division manager.

### What About Ford?

May 8, 1931.  
Mr. E. M. Flaherty, Division Mgr.  
E. I. du Pont de Nemours & Co.,  
Parlin, N. J.  
Dear Ed:

Upon my return from Chicago I find your letter of the second and am sorry that you are not agreeable to the meeting I suggested or a discussion of the patent situation with the important group mentioned in my letter of the 28.

I have been very anxious to dispose of this matter but the longer it is delayed the more developments present themselves which make it difficult to know just what is the right action to take.

In my letter of the twenty-eighth I referred to the fact that I had been advised that the Ford Motor Co. do not intend to take out any license and as you do not answer this question in your letter of the second I am repeating the inquiry as you of course must know that if Ford did not take out a license and was permitted to sell all of the big body manufacturers and other automobile manufacturers with his surplus production of lacquer it would be very easy for him to undersell all other lacquer manufacturers.

This is a very important point that ought to be cleared up and I would like to know whether it is the intention of the du Pont Co. to insist on the Ford Motor Co. taking a license in the event of their patents being validated.

I also made inquiry with regard to an agreement on your part to defend the patents against non-signers and as this is another very important point I would like to have you answer it.

Surely there would be very little sense in anybody taking out a license if there was no definite agreement to the effect that the du Pont Co. would vigorously prosecute non-license signers and agree to defend the patents in every other respect.

I am sure you must admit that these are very important points and that we ought to be advised as to your company's attitude in this respect.

Looking forward to hearing from you more fully on this whole subject, I remain  
Yours very truly,  
RWL:T  
Vice President.

### Questions Befog Main Issue

Parlin, N. J. May 13, 1931.  
Mr. R. W. Levenhagen, Vice President,  
The Glidden Co., Cleveland, Ohio.  
Dear Dick:

It seems to me you can safely take it for granted that the license program will be administered in whatever manner serves the best interests of the lacquer industry as a whole.

Points such as those raised in your letter of the eighth are typical of the

kind of questions that could be asked indefinitely in connection with such an involved situation as exists today. Answering them individually merely leads to others and serves to befog the main issue, which is whether you desire to accept the license we have offered.

As stated in my letter of the second, we feel that you have had sufficient time to make up your mind as to the course of action you wish to follow, and our present inclination is to withdraw our offer and institute infringement proceedings against you if your acceptance is not received in the near future.

I regret the necessity of writing you in this way, but feel obligated to do so in order that you may not be under any false impression as to the probable result of further delay on your part. Very truly yours,  
(Signed) E. M. FLAHERTY,  
EMF:ESC  
Division manager.

### Inviting Legal Action

May 15, 1931.  
Mr. E. M. Flaherty, Division Manager,  
E. I. du Pont de Nemours & Co.,  
Parlin, New Jersey.  
Dear Ed:

I am in receipt of your letter of May 13 and very much regret this letter does not throw any further light upon the matter of the patent licenses about which we have been corresponding.

In order that there may be no misunderstanding, I wish to explain that our company is desirous of taking a license under your patents if the terms of the license are fair to us and fair to our customers, and with the understanding that your company—the owners of the patents—are prepared to defend the patents against infringement.

Our business has been built up through many years of hard and conscientious effort. We believe we have the good will and friendship of our customers, and it is for this reason we feel that in taking out a license under these patents that we must be sure that in doing so we are going to be able to treat our customers just as well as any other manufacturer.

In my letter to you of May 8 I referred to the fact that I had been advised that the Ford Motor Co. do not intend to take out any license and I asked you specifically whether your company intends to bring suit against Ford Motor Co. This is a very important point and it would seem to me that if your company is desirous of bringing a suit to test the validity of the patents, that you could not overlook such an important concern as the Ford Motor Co.

Surely those who take a license under your patents and pay your company a royalty for the privilege, must have some protection under the patents under which they would operate and if you decide it is going to be your policy to defend these patents by bringing suits against all infringers, then we certainly desire to take a license and will cooperate in every way possible.

In the event, however, that you want us to sign a license without any obligation on your part to defend the patents, and if you take the position that we must either sign such license without asking for any information or submit to a suit for infringement, then the only thing our company can do is to invite you to proceed with the suit at the earliest possible moment. If there is any way we can facilitate the joining of

issues in this suit promptly, our attorneys will cooperate to the fullest extent. Our company is an Ohio corporation and we would prefer to have suit brought in this state if convenient.

If you will inform me of the wishes of your counsel we can doubtless arrange a meeting between our legal representatives that will take care of the matter without too much trouble and expense.

Yours very truly,  
RWL:V  
Vice president.

### Yes and No, Mostly No

COPY May 19, 1931  
Mr. R. W. Levenhagen, Vice President,  
The Glidden Co., Cleveland, Ohio.  
Dear Dick:

I have read your letter of the fifteenth several times with a view to deciding whether it is intended to say Yes or No, and am forced to the conclusion that it appears to say both, perhaps with the emphasis on the No.

It does not seem to me that you can fairly take the position that we are demanding that you accept a license without asking for any information, because you know only too well that you have been given a great deal of information regarding our attitude toward this entire proposition.

Also, as I have previously pointed out to you, many other prominent concerns have satisfied themselves, as indicated by their acceptance, as to the fairness to them and to their customers of our license terms without receiving any more detailed information than you have had. This naturally causes us to believe that you are unwilling to accept a license without imposing upon us specific obligations that we do not feel called upon to assume.

Under these circumstances it seems to me that our mutual interest probably would be best served by our promptly filing an infringement suit against your company, and I am therefore instructing our legal department to proceed accordingly.

Very truly yours,  
(Signed) E. M. FLAHERTY,  
EMF:ESC  
Division manager.

### Bill of Complaint and Answer

The plaintiff alleged in his bill of complaint that the defendant, for the past six years, had been infringing claims, 2, 3, and 6 of reissue patent No. 16,803 and claims 2, 3, 6, 7, and 13 of patent No. 1,710,453 by making, using, and selling coating compositions embodying the inventions claimed in the patents.

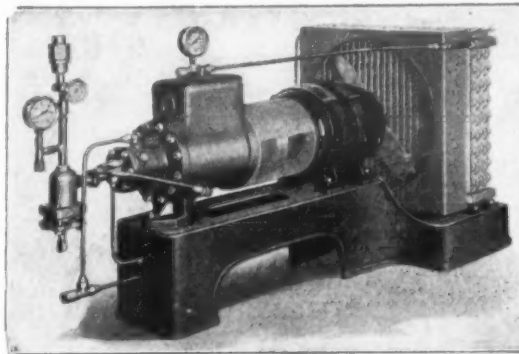
The plaintiff asked for an injunction restraining the defendant from further infringing the patents, and for costs and an accounting for profits and for damages.

The defendant asked for a bill of particulars and the plaintiff set forth a coating composition known as "Seashore Tan Auto Enamel No. 2017" made and sold by the defendant, as evidence of the infringement of the patents.

Plaintiff also set forth the correspondence between Flaherty and Levenhagen as evidence that the defendant had knowledge of the patent, and that the plaintiff had given the defendant definite

(Concluded on Page 8, Column 1)

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**The Aetna Rubber Co.**

Ashtabula Ohio



## JUDGE SAYS LACQUER PATENT IS NOT VALID

(Concluded from Page 7, Column 5)

notice of infringement and of its intention to bring suit therefor.

The defendant's answer to the bill of complaint alleged that reissue patent No. 16,803 and patent No. 1,710,453 were invalid and void because Edmund M. Flaherty and Maurice V. Hitt were not the original inventors of the things patented, but that the same were known and used by others in this country before their alleged invention and discovery, that the things had been previously patented, and that they were in public use and on sale in this country for more than two years prior to the application for the patents named above.

The defendant also alleged, with reference to Flaherty's reissue patent, that the surrender and cancellation of the original patent and its reissue were illegal, that the reissue patent was not for the same alleged inventions as the original patent, that the reissue patent represented an unlawful expansion of the original patent in an attempt to cover and embrace similar compositions, and that the reissue patent was obtained through fraud and misrepresentation in that the application upon which the reissue was granted was an attempt to secure a patent for an alleged invention not made by the applicant at the time of filing his application for the original patent.

On March 2 du Pont & Co. withdrew the Hitt patent from the bill of complaint, leaving the case to be decided on the validity of Flaherty's reissue patent No. 16,803.

### Judge's Decision

Judge Campbell, in his decision, held that the reissue patent disclosed no inventive concept, and that the subject matter claimed was known and used prior to the earliest date which Flaherty could claim.

The decision of Judge Campbell follows in part:

"... The sale by the defendant of nitrocellulose enamel containing nitrocellulose whose viscosity characteristic is below the limit defined in the claims of the patent is admitted, but there is no reference in the stipulation as to the source of the nitrocellulose base used in the defendant's lacquers, or to the method by which the viscosity of its nitrocellulose is reduced.

"The defendant purchases its nitrocellulose from the Hercules Powder Co.

"The patent in suit is for a product and not for a method or process, and as I understand the plaintiff's position, it does not contend that defendant follows or imitates in any way the method of reducing the viscosity of nitrocellulose disclosed in the patent, but insists that the method by which the viscosity of the nitrocellulose is reduced does not make any difference.

"The charge of infringement is based solely upon the fact that the defendant uses a viscosity nitrocellulose base lower than the upper limit defined in the claims of the patent in suit."

"... A change in the viscosity characteristic of the nitrocellulose base does not change its functional relation to the other constituents of the lacquer, as they cooperate in the same way to produce the same result without regard to the change.

"That the plaintiff may have discovered and invented a new process for the making of lacquer is not proof that it has invented a new lacquer, as the word 'new' is used in the patent law.

"Nor is the fact that a new nitrocellulose, with a new viscosity characteristic, is used proof of the production of a new lacquer, as the word 'new' is used in the patent law, as the lacquer produced is the same old lacquer with the same mode of operation, the only difference being the increased covering power due to the lower viscosity of the nitrocellulose.

"The difference is in degree and not in kind, and in my opinion the product is not broadly patentable."

"... The evidence, including Mr. Flaherty's own testimony, clearly shows that the art generally, and Mr. Flaherty himself, knew the relationship of the viscosity characteristics of the nitrocellulose in lacquer to the covering power of the lacquer long prior to any date of the alleged invention of the patent in suit, and therefore the instant suit is brought directly within the ruling of DeForest Radio Co. v. General Electric Co.

"This would be true even if the contentions of the plaintiff were sustained by the evidence, which I believe they are not, that Flaherty taught an unprecedented low order of viscosity of a wholly different order from those previously used, and that the idea was thoroughly ingrained in the art, that nitrocellulose reduced in viscosity to the extent contemplated by the Flaherty patent could not be used in commercial lacquers.

"The evidence does not sustain either of the plaintiff's said contentions, and if it did, it would not justify the monopoly which the Flaherty patent asserts."

"... In the instant suit, although plaintiff's counsel says, that the degree of reduction contemplated by Flaherty's patent was unprecedented and characterized it as of a wholly different order, there is nothing to show it more than different in degree from what had previously been done, or that there was more than a mere change in degree of a particular property possessed by it over other nitrocellulose lacquers in common, that is covering power. No critical change was effected in the product.

"The relationship of the viscosity characteristics of the nitrocellulose in lacquer to the covering power of the lacquer was well known to the art prior to Flaherty."

"... The evidence shows that before the World War the present very low viscosity nitrocelluloses now obtainable were not commercially available to the lacquer manufacturer and that after the War there was a demand for lower viscosity nitrocelluloses, and under its pressure these were produced by various manufacturers thereof, by various chemical and physical treatments after nitration, some by old methods and some by new methods.

"If the new methods involved the exercise of invention, those methods would be patentable.

"It may well be that Pitman's is such a method.

"The patent could cover only the new method and its substantial equivalents.

"No sound basis for a valid patent is afforded for the product by defining it as one in which the viscosity of the nitrocellulose is less than in any theretofore produced, and that, it seems to me, is the definition of the patent in suit.

"Flaherty did not invent any method of reducing viscosity, but merely applied to use in lacquers Pitman's chemical treatment of nitrocellulose solution to reduce their viscosity for a known purpose and with the expected result.

"The disclaimer filed by the plaintiff emphasizes the lack of invention of the patent in suit."

Judge Campbell also upheld the contention of the defendant Glidden that anticipation and prior knowledge were shown in previous U. S., British, and German patents.

## 2 Westinghouse Coolers Installed by Utility

SYRACUSE, N. Y.—Westinghouse electric water coolers, complementing the modernistic interior decoration of the new building housing the Syracuse Lighting Co. here, have been installed recently by Treman King Co., Westinghouse refrigerator distributor at Ithaca, N. Y.

The coolers, finished in black micarta and inlaid with aluminum strips, harmonize with the architect's idea of chromium on black background as the interior decorative scheme of the building.

MANUFACTURERS OF "GENUINE DETROIT" AUTOMATIC EXPANSION VALVES, "GENUINE DETROIT" THERMOSTATIC EXPANSION VALVES, AMERICAN FLOAT VALVES, HIGH AND LOW PRESSURE TYPES, AMERICAN CASTINCOIL DOMESTIC UNITS, AMERICAN CUBE MAKERS, AMERICAN REFRIGERATION SECTIONS, COMMERCIAL TYPE, MERCODI CONTROLS

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Division of AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

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Dehydrated and Sealed or Open End; Plain Bright or Tin Plated;  
A.S.T.M. Specification B68-30T. Immediate Delivery from Stock.

**WOLVERINE TUBE COMPANY**

1491 Central Avenue, Detroit, Michigan

Sales Offices in 29 Cities

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## WOLVERINE COPPER TUBING

## Capacities of Vilter Rotary Compressors

In lbs. ice melting effect "IME" per 24 hours with 20° F. evaporating temperature of refrigerant and condensing temperatures corresponding to prevailing conditions as indicated. (See story on page one.)

No. of Compr.	Motor H.P.	Rev. per Minute	AMMONIA		METHYL CHLORIDE		FREON (F-12)	
			95° F. Water	110° F. Room	95° F. Water	110° F. Room	95° F. Water	110° F. Room
			85° F.	95° F.	85° F.	95° F.	85° F.	95° F.
3	1/3	1150	354	322	1750	297	275	1750
5	1/2	1150	546	498	1750	453	420	1750
7	3/4	1150	828	756	1750	694	645	1750
10	1	1150	1114	1020	1750	922	857	1750
15	1 1/2	1150	1764	1618	1750	1489	1376	1750
20	2	1150	2352	2158	1750	1970	1836	1750
30	3	860	3566	3272	1150	2620	2432	1150
50	5	860	6026	5556	1150	4450	4132	1150

NOTE: Standard construction does not include air cooled condensers on any ammonia machines, or machines No. 30 and 50.

## LITERATURE OF MANUFACTURERS

Catalogs, bulletins and other materials recently issued. Manufacturers are requested to send copies of new trade literature to Electric Refrigeration News.

### Sarco Temperature Regulators

Sarco Co., Inc., manufacturer of brine controls for refrigeration equipment, has recently issued a bulletin giving the specifications of its temperature regulators for cold room control and drinking water control; the dimensions of its reverse acting valves for the regulators; and specifications for its self-cleaning strainers. A description of the operating principle of the temperature regulators is also contained in the leaflet.

### Kerotest Valves and Fittings

The Kerotest Mfg. Co., Pittsburgh, has just issued a 48-page catalog describing its complete line of forged brass valves and fittings for mechanical refrigeration service. Many new types of valves, such as two-way and three-way diaphragm packless valves for large commercial and air-conditioning installations, several new construction features, and new applications are pictured.

### Kason Refrigerator Hardware

A catalog containing a description of its complete line of refrigerator and butcher fixture hardware has recently been issued by the Kason Hardware Corp., Brooklyn. Latches, locks, shims, trip fasteners, hinges, and gaskets for refrigerators are pictured and described.

### M.R.C. Ball Bearings

Marlin-Rockwell Corp., manufacturer of Guernsey, S.R.B., Strom, and M.R.C. ball bearings, has recently issued a circular letter to engineering concerns offering help in design problems, and stating that it now has 22 varieties of bearings available for the engineer and designer, eight of which are pictured in the letter.

### Diesel Engines

Illustrations of installations of Diesel engines in ice and refrigeration plants, in skating rinks, etc., comprise the most part of the 32-page catalog published by the Atlas Imperial Diesel Engine Co., Oakland, Calif.

Explanation of the Diesel principle is also given, and its application in municipal, private, and industrial power plants, in mills, oil well drilling, mining operations, as well as in refrigeration plants is set forth.

### Ranco Thermostat

The Automatic Reclosing Circuit Breaker Co., Columbus, Ohio, recently placed on the market a type F Ranco thermostat intended for use with domestic refrigerators, water coolers, bottle coolers, ice cream cabinets, etc. Bulletin No. 610 describes this thermostat, giving pictures of it, sectional drawings, installation diagrams, and listing its special features.

### Degreasing Machines

G. S. Blakeslee & Co., Chicago, has recently obtained the Canadian and American rights on the Dr. Wolf patent, Munich, Germany, for degreasing metal parts by the use of a super-solvent named Blacosolv. A 16-page booklet describes the various models and gives illustrations of the Blakeslee degreasing machines.

### Westinghouse Research

"Stories of Westinghouse Research," a booklet prepared by Collin K. Lee and Hendley N. Blackmon, Westinghouse general engineers, gives stimulating examples of scientific discoveries made in the Westinghouse laboratories.

Each description of a new invention is accompanied by a picture of the inventor and a short history of his work.

## ICE REFRIGERATOR CONCERN RUNNING AT FULL FORCE

COBLESKILL, N. Y.—Harder Refrigerator Corp., manufacturer of Kleen-Kold and Hudson ice refrigerators, is now running full force, employing approximately 150 men, according to F. H. Ryder, vice president of the company.

## Book Review

### "THE AUTOMATIC CONTROL OF REFRIGERATION"

Authors: H. T. Lange, chief engineer, and A. B. Schellenberg, district sales manager, Alco Valve Co. Publisher, Alco Valve Co., 2628 Big Bend Blvd., St. Louis, Mo. Pages: 98. Date of Publication: 1932. Price: \$1.50.

UNIQUE in its devotion entirely to the subject of refrigeration controls, this new paper-bound book answers many questions that constantly bob up in the practice of refrigerating engineering. It should be of considerable value, first as an educational medium, and second as a reference handbook to designers, installers, and service men in both household and commercial refrigeration.

Perhaps the title of the book would more properly be, "The Automatic Control of Refrigerants," for that is substantially what it treats. With the exception of a chapter devoted to a series of electrical wiring diagrams, the book specializes in control valves for automatic regulation of volatile refrigerants, brine, and water.

The principal devices described, both as to construction and operation, are the automatic expansion valve, thermostatic expansion valves, high-pressure float valves, magnetic valves, brine control valves, and unit cooler valves.

The first half of the book is of particular interest for its detailed explanation of the automatic and thermostatic types of expansion valves, and comparisons of their operation. The latter pages will be helpful to the designer and installer of special applications of refrigeration, including air conditioning, which have individual problems of automatic control.

The explanations are simple and clear, and bring out a number of new thoughts on a highly technical subject. Authenticated by the experience of the publisher, the volume should prove a handy addition to the refrigerating engineer's library.

## 2 MAYFLOWER COMMERCIALS INSTALLED IN STORES

LANSING, Mich.—Lansing Refrigeration Co., Mayflower distributor in this territory, has installed new commercial refrigeration equipment in two local retail establishments.

Child's restaurant here has purchased a 1-hp. Mayflower condensing unit to refrigerate a 6x8-ft. walk-in meat box and an 8-ft. top case, while Elmer Van Antwerp of Sunfield, Mich., has installed a 1-hp. Mayflower machine to cool a 6x6-ft. walk-in cooler and an 8-ft. double display case.

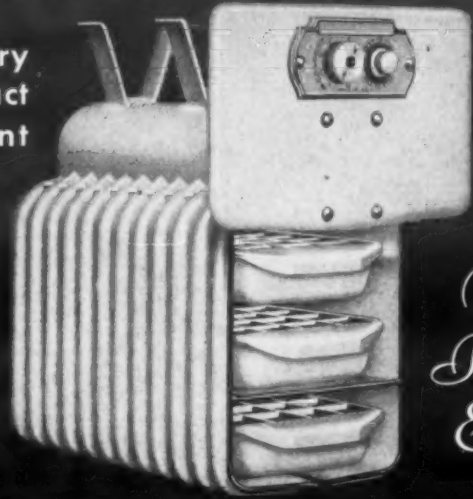
## SALES REPRESENTATIVE TO OPEN BRANCH OFFICE

NEW YORK CITY—Melchior, Armstrong, Dessau Co., manufacturers' representative for refrigeration and oil burner supplies, will establish a branch and warehouse in Philadelphia on Jan. 1, 1933, according to L. A. Michaelson, vice president.

This branch will carry the company's Melco brand of parts and supplies for the refrigeration and oil burner trades in eastern Pennsylvania, Delaware, Maryland, District of Columbia, and southern New Jersey.

## The MULLINS SHEET METAL EVAPORATOR

Sanitary  
Compact  
Efficient



White  
Porcelain  
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DESIGNS FOR USE WITH HIGH SIDE AND LOW SIDE FLOATS — IMPROVED FAST FREEZING SHELF AT SLIGHTLY INCREASED COST.

Manufacturers: Write for Details!

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REFRIGERATION DIVISION  
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